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THE differential made by the Pullman Company between its rates for upper and lower berths has thus far had little or no effect. The ticket agents report that, as before the change in rates was made, practically all passengers, in buying sleeping car tickets, ask for lower berths. It seems to us that this is as it should be. A bonus of 40 cents a night could hardly be expected to attract the average passenger into a place which he considered undesirable; while the sum serves very well as a nominal consolation to a passenger when, by force of circumstances and of his respect for the principles of economy in transportation, he is obliged to use an upper.

THE Interstate Commerce Commission has ordered a reduction in passenger fares frankly for the reason that the railway company is grossly over-capitalized. The reason is not stated baldly in just these words; it is said that besides considering the facts disclosed by the record, the commission has examined "other circumstances and conditions pertinent to the issues in-

involved"; but the stock and bonds of the company aggregate \$207,895, a mile, while by implication the commission finds (without giving any facts to support the finding) that about \$50,000 a mile would be a reasonable figure; and a reduction of 33⅓ per cent. is ordered. The case is that of Beall vs. the Washington, Alexandria & Mount Vernon, an electric line from Washington, D. C., to Alexandria, Va. The distance from Washington to Alexandria is 7½ miles, and the single trip fare is 15 cents. To stations about two miles nearer Washington the fare is 15 cents also, and the complaint is from passengers at these stations, which are included in the Alexandria zone. Twenty-five tickets between Washington and the complaining stations are sold for \$2.50, making a rate of about two cents a mile. The order of the commission requires that single trip tickets be sold at this rate (10 cents a ticket; two cents a mile). The line has been in operation 14 years, and apparently, says the commission, it has been economically and efficiently managed. Other suburban lines entering Washington charge 10 cents for similar distances. Ten cents to the complaining stations gives the same revenue per passenger mile as the 15-cent rate to Alexandria. The defense of the company was, first, that the travel from the complaining towns was light; second, that the dividends paid by the company have been very meagre; and, thirdly, that the company is not subject to the Interstate Commerce law. To the argument that the revenue derived from the business at these small stations does not pay for the service rendered, the commission replies that it may well be assumed that as the trains must be run, to accommodate Alexandria, this additional traffic is clear gain; and secondly, the financial condition of the company is not so distressing as is claimed. Of the capital, about 60 per cent. consists of bonds on which 5 per cent. has been paid, while for the last three years dividends have been paid on the stock of 1 per cent., 2 per cent., and 2 per cent., with a considerable surplus each year. If no money had been retained as surplus, 5 per cent. could have been paid on the stock; while if the stock and bonds together had amounted to only \$50,000 a mile, the earnings in 1910 would have paid 16 per cent. on the investment. If the 20,000 trips between Washington and the complaining stations had brought in a revenue of only 10 cents each, the net loss to the road would have been \$1,000, and it would still have been able to pay 2 per cent. on its stock and lay aside a good surplus. The claim that the road was not subject to the Interstate Commerce law was not seriously pressed.

MR. PARK, now vice-president of the Illinois Central and formerly for several years an officer of the Union Pacific, makes the positive statement, as refreshing as it is unusual, that the Union Pacific and other Harriman lines have abolished avoidable train accidents! He has adopted certain Union Pacific methods on the Illinois Central, and the statement comes out in connection with the announcement that the I. C. and its controlled lines during the past calendar year carried 30,728,211 passengers, of whom not one was killed in a train accident; and this includes passengers carried on freight trains. The passenger mileage was about 800 millions; passenger train mileage 15 millions, and freight train miles 22½ millions. The number of train accidents of all kinds was equal to 7.43 accidents per million locomotive miles, which he says is nearly 50 per cent. less than the number occurring in the preceding year. Mr. Park says that the improvement over former records is due largely or mainly to surprise checking. The division officers now report very few misunderstandings or violations of rules, showing that the natural prejudices of the men against surprise checking have been largely overcome in the short space of time since Mr. Park introduced the methods which he had found so successful on the Union Pacific. His reference to the Union Pacific's efficiency tests, which have now been conducted for several years, is to the effect that they "have practically eliminated avoidable accidents." He includes the company's policy of giving publicity to the causes of

train accidents as an important factor in improving the service. Presumptive evidence of the correctness of this declaration, as regards the Harriman lines, is found in the report of those lines, recently published, showing complete freedom from fatal train accidents to passengers during the past year. Both on these lines and on the Illinois Central the rules for surprise checking are systematic and rigid. One of them requires that when a passenger train is stopped by a flag or torpedo, or by an unusual signal, the conductor shall confer with the engineman before proceeding. For the last month (February, 1911) the surprise checking on the I. C. resulted in the following percentages of efficiency: Chicago division 77; St. Louis division 83; Springfield division 78; Peoria division 83; Freeport division 90; Dubuque division 67; and Cherokee-Omaha division 100. Mr. Park says that on the Harriman lines the efficiency of employees has been brought to that degree of perfection that on block-signalized lines a flagman is not required to go back if the signal can be seen at "stop" one half mile in the rear. No other road in this country has such a rule, and very few officers would be willing to put their efficiency to the test of an abolishment of flagging to the extent that the Harriman Lines have done. As Mr. Park well says, this degree of perfection could have been attained only after both officers and employees had undergone a very systematic and exhaustive drill in efficiency.

THE Pennsylvania also reports having killed no passengers in a train accident in 1910, and the number of passengers carried was 136 millions; and during the last three years when the number of passengers carried on the lines east of Pittsburgh and Erie was 372 million, only one was killed as a result of a collision or derailment of trains. These statistics include the traffic of the Cumberland Valley, the Baltimore, Chesapeake & Atlantic and the Long Island roads, as well as those more closely affiliated with the Pennsylvania. Attention very properly is called to the fact that the Pennsylvania has a heavier traffic per mile of road than any other large system in the country. The passenger train mileage was 124 millions and the freight train mileage was 113 millions. Passenger trains meet freight trains so frequently that the passengers' view of the scenery along the line is seriously interfered with! To maintain those thousands of freight cars, freight-car doors and trucks, in the high degree of perfection necessary to assure complete immunity to the passing passengers is one of the greatest achievements of the railway art. The number of passengers injured in train accidents on the Pennsylvania in 1910 was only 84, and this was but one half the number injured in the year 1909. These figures include every case requiring surgical or medical attention. There were no collisions affecting passenger trains on the Pennsylvania Railroad proper in 1910, and there were only two on the subsidiary lines. The total number of derailments on all of the lines in 1910 was 203, of which only 16 affected passenger trains. The number of collisions and derailments shows a decided decrease each year since 1907. Records like these may serve to remind us that the government accident bulletins do not constitute a complete picture.

THE Supreme Court of the United States, in a decision by Mr. Justice Holmes, has sustained the Atchison, Topeka & Santa Fe in its claim to legally keep a telegrapher at work from 6:30 a. m. to 6:30 p. m., with three hours off in the middle of the day; this in an office assumed to be kept open continuously night and day, which assumption seems to be endorsed by Judge Holmes, in spite of the 3-hour intermission. The suit had to do with the telegraph office at Corwith, Ill., near Chicago, which was kept closed from 12 o'clock to 3 o'clock by day and by night, but open the rest of the time. The government claimed that this was in violation of the law forbidding the confinement of operators to their work in day-and-night offices, over nine hours; and a verdict was secured in the district court; but the circuit court of appeals (which is now sustained by the supreme court) reversed the judgment. Judge Holmes says it

is impossible to extract the requirement of fifteen hours' continuous leisure from the words of the statute by grammatical construction alone. The proviso does not say nine "consecutive" hours, as was said in the earlier part of the section [referring to trainmen], and if it had said so, or even "for a longer period than a period of nine consecutive hours," still the defendant's conduct would not have contravened the literal meaning of the words. A man employed for six hours and then, after an interval, for three, in the same twenty-four, is not employed for a longer period than nine consecutive hours. And the Court says that in order to accomplish the purpose contended for by the government it would have been necessary to add a provision requiring 15 consecutive hours off duty. As the word "consecutive" was used earlier in the statute and was not used here, the judge reaches the conclusion that there was no oversight in the choice of words. This is a fine example of how we make laws. The leaders of the telegraphers' brotherhood knew just what they wanted. They wanted to compel the employment in each office of three operators for eight consecutive hours each, three such tricks making a day of 24 hours. They made the clause read "nine hours," so as to allow for a little flexibility. They intended to make Congress see their view and adopt it. The congressmen, however, satisfied themselves, no doubt, that they had done their duty when they had given the telegraphers just what was asked for. Now comes Mr. Justice Holmes and gravely assumes that the congressmen really gave careful thought to the matter and intended to allow split tricks *ad libitum*. As this hours-of-labor law, in spite of some good in its purpose, and perhaps some beneficial results in its operation, is nevertheless crude and wasteful, anything that will mitigate its pressure is to be welcomed; but no one acquainted with the railway station service can interpret Judge Holmes' decision as other than a nullification of the well-understood purpose of the law. The judge thinks that Congress intended to allow split tricks aggregating nine hours. If any congressman did so intend he was trying to fool the telegraphers; and who ever heard of a congressman treating a labor leader other than with the highest respect? But to restore to the law its intended meaning it will only be necessary to pass an amendment, and that, of course, the brotherhood can have for the asking.

THE FRICTION OF FREIGHT TRUCKS.

WHEEL flange friction and wear, while always a matter of concern, is becoming one of large importance, because it calls for such heavy expense for car maintenance. A constant effort is being made to discover the principal causes of flange friction and the means by which it may be reduced. The subject is one which may be regarded as affecting expenses for car repairs in the renewal of wheels and of means by which the flange life may be prolonged by improvement in the quality of metal in the flange; or it may be considered as one of the principal causes of train resistance on curves, resulting in increased expense for fuel in hauling the train and for rail renewals. In the latter case, the whole truck structure may be taken as contributing more or less to this wear and resistance, and the controversy over the relative merits of the square truck and the loose truck in causing sharp flanges is one of long standing. The use of cast steel in the manufacture of freight trucks has led to the design of decided modifications and departures from the arch bar type of truck, which was the standard for many years, and there are now in service so many trucks which differ from it in essential particulars that it is important that their action on the track and especially on curves be accurately measured.

The experiments at Granite City, Ill., which were conducted by Professor Endsley under the auspices of the American Steel Foundries, are perhaps the most complete and accurate tests of the friction of freight trucks on curves which have ever been conducted, and we devote considerable space in this issue to

the publication of the principal part of the report which describes them. The testing of trucks separate from the car body is new, and we believe little or no work of this kind has been previously attempted. The method of obtaining the desired velocity in the contracted space of a shop yard and without a locomotive is ingenious, but adequate. The loading of the truck with heavy masses of metal in the bolster and on top of it, so that the weight on the track was equal to that of half an empty car, was also an original method of testing, but we confess to sharing the doubts of those who question whether the results so obtained would be the same with loaded cars and trains. The center of gravity of the test truck is much nearer the track and the action of the load is through a more rigid mass directly to the wheel flange than in the case of a loaded car body resting on the truck, for in this case the load is concentrated probably 2 ft. higher from the rail, and its application is through a rolling motion which is more flexible than in the more compactly loaded truck. On the other hand, there are some advantages in testing flange friction by the use of the truck separately, for in this way differences in truck construction are alone responsible for differences in results, while with the loaded cars in a test train the results are complicated by the uncertainties due to the friction of the center plates and side bearings and to the lack of normal flexibility in the drawbars and draft rigging.

With steel cars having stiff body bolsters, the variable condition of side bearings may be largely eliminated and tests of loose or square trucks under the same car bodies should eliminate the principal disturbing factors. We trust, therefore, that the experimental work on freight trucks which has been so thoroughly commenced, may be continued with loaded cars in trains by a committee of the M. C. B. Association, so that results may have the sanction and authority of that body. The report states that such tests have been conducted with loaded cars, and that the results present a striking confirmation of those obtained at Granite City, and we hope to publish the facts relating to these road tests when they are available.

We have not included in our abstract any figures relating to the experiments with trucks on tangents, as the difference in square and loose trucks as revealed by these tests are so slight that they may be regarded as almost within the limits of error in testing. The important conclusion reached as a result of the experiments with a truck on curve is that the resistance increases as the trucks get out of square, and, therefore, that type of truck which is provided with means for preventing the truck sides from shifting with respect to each other will run with less resistance than that which allows the wheels to jam on the curve as a result of the shifting of the truck sides.

The diagrams bring out the fact that the resistance was not materially affected until the truck was at least 1 in. out of square. When this figure reached $1\frac{1}{2}$ in. the increase in resistance was 10 lbs. per ton more than that offered when the trucks were out of square $\frac{1}{2}$ in. or less, so that there seems to be a point somewhere near 1 in., beyond which the resistance per ton is materially increased. In view of this fact, the tests led to the classification of trucks into two general types—loose and square. Those which went out of square $\frac{1}{2}$ in. or less in rounding the 22 deg. curve were classed as square trucks, and those which went out of square $1\frac{1}{2}$ in. or more were classed as loose trucks. The method of measuring the degree of squareness is well illustrated by the photographs which accompany the report.

The main conclusion drawn from the experiments is that a truck which is constructed in such a way that it will remain square and hold the axles radially with the curve will cause less resistance than one which does not remain square and allows the axles to shift. This difference in favor of the truck which is held square increases with the curvature. On a 5 deg. curve it amounts to 3 lbs. per ton, or 22.8 per cent.; on a 10 deg. curve the difference is 6.2 lbs., or 29.7 per cent.; on a 15 deg. curve the difference is 9.3 lbs., or 33 per cent., and on a 20 deg. curve it is 12.4 lbs., or 35 per cent.

The wide publicity which is given to the results of these truck tests by the distribution of the elaborate and handsomely printed pamphlet, and by our own abstract, should serve to excite an unusual interest in the subject of truck design as materially affecting train resistance and the cost of wheel maintenance, and show it to be worthy of further investigation.

NEW YORK CENTRAL & HUDSON RIVER.

E. H. HARRIMAN and W. C. Brown, the latter at that time senior vice-president of the New York Central & Hudson River, were the men who first began the agitation for higher freight rates in 1907. Mr. Brown was one of the most active supporters of the railways' contentions during the entire campaign for higher rates, and, therefore, his attitude toward the commission's action in refusing to grant these higher rates is of unusual interest. It is all the more interesting because the Interstate Commerce Commission itself was free to acknowledge that the New York Central made a much stronger showing in its plea for higher rates than did either the Pennsylvania or the Baltimore & Ohio. We have Mr. Brown's view in the annual report of the New York Central & Hudson for the calendar year ended December 31, 1910, just issued:

"The decision has been accepted in good faith, and every method of economy that can be enforced without resulting deterioration of the property or impairment of the efficiency of the service is being adopted. . . . If the forecast of the Interstate Commerce Commission, that increased volume of business and such economies as can wisely be adopted will offset the large increase in cost of operation, is realized the railways will very gladly acknowledge that they were mistaken in their apprehensions.

"On the other hand, if the results of operation as they shall be developed month by month demonstrate that these apprehensions were not entirely groundless, further appeal will in due time be made to the commission, with full confidence that needed relief will be granted."

And President Willard, of the Baltimore & Ohio, when first told of the commission's decision in the rate cases, remarked that he hoped the commission was right.

The New York Central & Hudson River, which operates 3,785 miles of road, of which about 800 miles is owned, is peculiarly situated in regard to the cost of its service. It is a road that runs through a densely populated territory which demands a high class of service and where conditions of operation are more nearly akin to conditions in England than to conditions in the western part of the United States. Moreover, the New York Central has the departmental form of organization common on English roads, and the Central is the only large railway company in this country that has frankly adopted this form. During the last three years a great deal has been done to make this organization an effective machine for operating a railway, and, while there is still a good deal to be accomplished toward better team work, the progress that has been made since 1907 is very great.

In the calendar year 1910 the New York Central's expenses increased out of all proportion to the increases in gross. Last year total operating revenue amounted to \$99,000,000, an increase of \$6,700,000, while operating expenses totaled \$74,100,000, an increase over 1909 of \$9,500,000. If this heavy disproportionate increase in expenses were shown for the New York Central alone, it might with some justice be claimed that it was due to lack of operating efficiency, but since it is general for all roads, and especially so for roads operating in Official Classification territory, it is necessary to look to some more general cause than lack of efficiency in one particular organization.

The wage increases of the fiscal year 1907 were made toward the last of the year, so that only a small part of the effect of this increase was felt in that fiscal year, and early in 1908 the panic and its resulting depression had compelled the railways to

enforce the most rigid economy. A great number of employees were laid off early in 1908. There was no decrease in wages, but since the pay-roll was so much smaller, the operating expenses as a whole never clearly reflected the effects of the raise in wages of 1907 until the end of 1909 and the beginning of 1910, when the roads found it necessary to largely add to their force of employees. These new men were hired at the increased wage rate, and, in addition to this, the railways were again forced to make a general increase in wages.

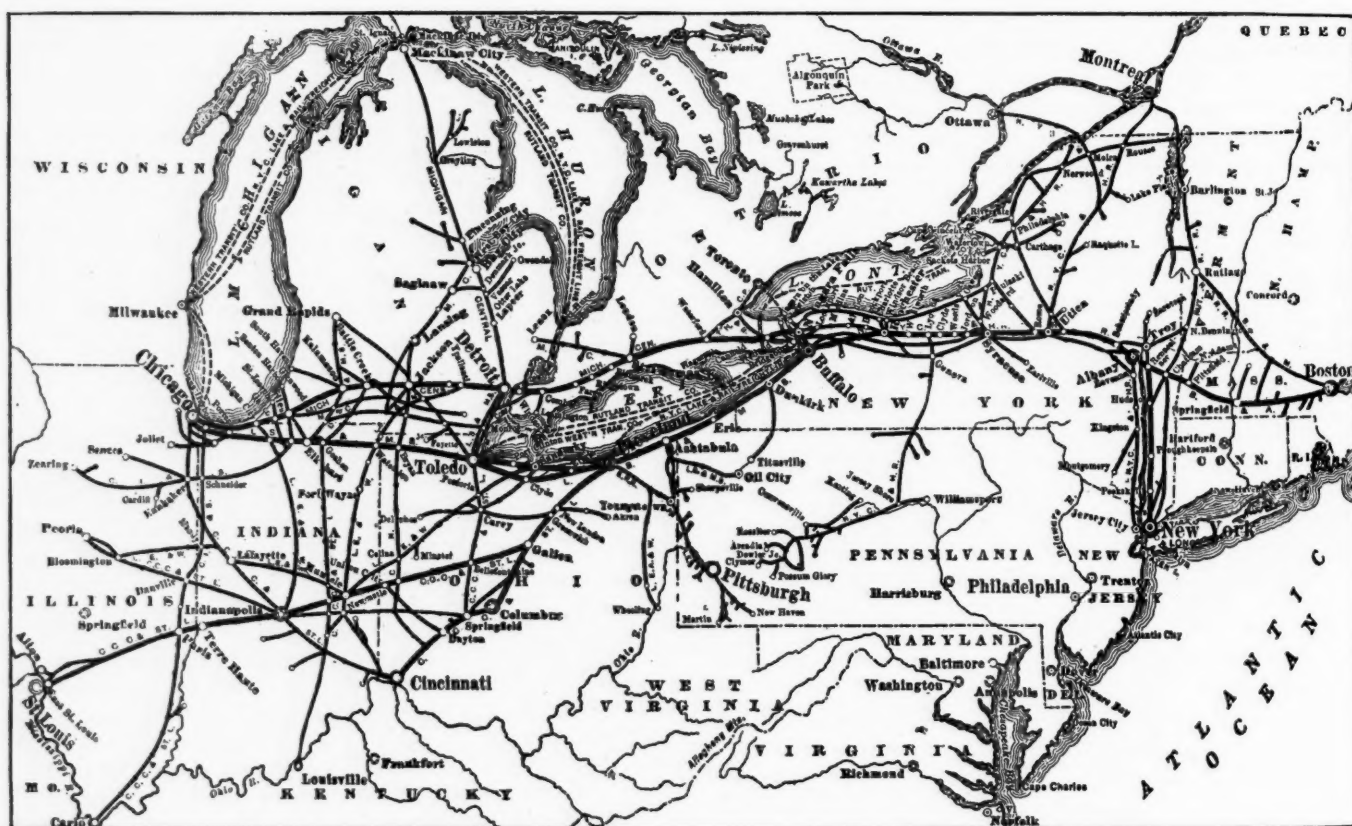
As a matter of fact, therefore, in 1910 for the first time railway expenses showed fully the effects of the wage increases of 1907, showed the wage increases of 1910, and showed the increase in expenses that was due to delayed maintenance and repair work which had been cumulative through 1908 and a good part of 1909. Now, the wage increases are a permanently added expense, but the cumulative repair work is temporary, and with a larger gross business it is fair to assume that each unit can be handled more economically.

The New York Central & Hudson River's operating ratio is

are always at once met by strong opposition from the traveling public.

In 1910 the total tons of revenue freight carried one mile on the New York Central & Hudson River was 9,277,000,000, an increase of 647,000,000 ton miles, or 7.5 per cent. This increased business was handled by 22,220,000 freight train miles, an increase over 1909 of 880,000 train miles, or 4.1 per cent. The total freight car miles amounted to 819,000,000 in 1910, an increase of 18,000,000 freight car miles, or but 2.3 per cent.

The total number of revenue passengers carried one mile amounted to 1,771,000,000, an increase of 112,000,000 passenger miles, or 6.8 per cent., while the passenger train mileage increased 5.4 per cent. In other words, the company found it possible to handle each unit of increased freight business considerably more economically, but this rule did not hold good with passengers. The average number of passengers per train mile was 66 in 1910, which is the same as in 1909. The average freight train load was 417.25 tons in 1910, an increase of 12.83 tons over 1909.



The New York Central Lines.

The map shows, in addition to the roads whose reports are reviewed in this issue, the smaller New York Central Lines, like the Lake Erie & Western and the Rutland.

high. The percentage of expenses to revenue was 74.15 in 1910 and 69.33 in 1909. An examination of the freight and passenger traffic statistics suggests one of the reasons for this high operating ratio. The total number of tons of freight carried one mile per mile of road, that is, the freight density, on the New York Central & Hudson River was 2,500,000 tons in 1910. This is a smaller freight density than that of either the Pennsylvania or the Baltimore & Ohio. On the other hand, the number of revenue passengers carried one mile per mile of road was 506,301 in 1910 on the New York Central. This is a very much greater passenger density than is shown by either the Pennsylvania or the Baltimore & Ohio. As the Pennsylvania has demonstrated in its accounts where passenger and freight expenses are separated, the margin of profit on passenger business is very much less than on freight business, and any economies that a road may wish to make in passenger service

The average receipt per ton per mile was 6.30 mills in 1910 and 6.31 mills in 1909. The average length of haul was 197.10 miles last year and 195.37 miles the year before.

The tonnage of most of the heavier commodities showed a considerable increase in 1910 over 1909, and the tonnage of grain also showed a considerable increase last year. The New York Central moved 1,995,000 tons of grain in 1910 as against 1,871,000 tons in 1909. The tonnage of grain, however, is no longer of such great importance to the New York Central as it was 10 or 15 years ago. This is illustrated by the fact that in 1910 the New York Central hauled 1,223,000 tons of castings and machinery, 1,136,000 tons of bar and sheet metal, 1,977,000 tons of cement, brick and lime, not to mention 11,900,000 tons of bituminous coal and 5,700,000 tons of anthracite coal. In all of these heavy articles mentioned the tonnage was considerably more last year than the year before.

The usual unit costs appear for 1910 as follows:

	1910.	1909.
*Maintenance of way and structures per track mile	\$1,792	\$1,615
†Repairs of locomotives	2,363	1,963
‡Repairs of passenger train cars	710	664
§Repairs of freight train cars	82	92

*According to the *Railway Age Gazette* formula, track mileage is obtained by adding together all first, second, third, etc., main and branch line tracks and one-half the mileage of switch tracks and sidings.

†Repairs only, and does not include renewals, overhead charges or depreciation.

Progress on the new Grand Central station at New York City is, of course, still one of the most interesting features of a New York Central annual report. During the entire year 1910 the work of rebuilding a great terminal station was carried on under traffic, and during the entire year operating costs were higher by just so much. There was spent and charged to capital account for the terminal improvements \$4,300,000. As was mentioned in our comments on last year's report, the company is building over the tracks a series of large commercial office buildings. One of these buildings is now complete and will be the source of income from now on. This experiment of making the space above tracks leading out of a terminal earn revenue is unique in this country, although it has been successful in Europe. The New York Central & Hudson River will itself own the building and act as renting agent. The New York, New Haven & Hartford, however, also has an interest in the property.

There is one incident in connection with the New York, New Haven & Hartford which took place since the close of the calendar year, and, therefore, is not mentioned in the annual report, but is nevertheless of considerable interest. The New York Central & Hudson River has owned for a number of years a majority of the outstanding preferred stock of the Rutland Railroad. This investment has never been a profitable one. The preferred stock calls for cumulative dividends, and these dividends now amount to a very large percentage due. The company has been unable to mortgage the property in any way or sell any additional capital securities until these cumulative dividends have been paid. It was impossible, therefore, to improve the property through expenditures charged to capital account, and all improvement work has had to be paid for out of net earnings. The Rutland has an entrance into Montreal over the Canadian Pacific, and the New York, New Haven & Hartford, in its contest with the Grand Trunk, greatly desired to get an entrance of its own into Montreal, it having always depended on the Grand Trunk. The New Haven, therefore, offered to buy a half interest in the New York Central's majority stock of the Rutland, and this half interest the New York Central was willing to sell, at presumably a fair figure. The New York Central, therefore, has gotten rid of a part of a rather unprofitable stock holding, and has probably made the remainder of that holding more valuable. The Rutland is now in excellent physical condition, and it seems probable that with the new arrangement with the New Haven it will get a considerably increased traffic, giving it the prospect of resuming dividends on its preferred stock. It should be mentioned that the common stock was convertible into preferred, and there is now almost no common stock outstanding.

One large expenditure of the New York Central that ought to be appreciated by the traveling public, is that of nearly two millions on signaling. The company spent \$428,000 for interlocking and automatic signal apparatus under the head of improvements to property, and also spent under the head of maintenance of way \$1,527,000 on signals and interlocking plants. This is \$500,000 more for maintenance of signals than was spent in 1909.

The balance sheet as of December 31, 1910, shows the company rather in need of additional working capital. Total working assets amounted to \$83,200,000, with working liabilities of but \$23,100,000, but of the working assets but \$6,800,000 was cash, which is rather a small amount of cash for a road doing a business of \$100,000,000 a year. During 1910 \$44,997,300 stock was issued, and \$5,000,000 of the debentures of 1904 were sold.

Last year the New York Central paid dividends of 6 per cent., and, while these dividends were not earned from operation, they were provided for by an extra dividend on the Lake Shore & Michigan Southern stock, and after the payment of 6 per cent. the New York Central & Hudson River had a surplus of \$900,000 comparing with a surplus of \$4,800,000 in 1909. It must be borne in mind, however, that dividends in 1910 called for 6 per cent. on \$222,729,300 stock, while in 1909 dividends called for but 5 per cent. on \$178,632,000 stock. Since the close of the calendar year the directors of the company have decided to put the stock back on a 5 per cent. basis.

In the New York Central situation there are certain very hopeful features. For one thing, the Lake Shore & Michigan Southern is apparently quite capable of continuing to pay an extra dividend of 6 per cent. besides its regular 6 per cent. dividends. In regard to the New York Central & Hudson River itself, the fact that gross earnings are increasing so fast and that the road in 1910 handled almost as great a ton mileage as in 1907 should, as was pointed out at the beginning of these remarks, tend, in the long run considerably to increase net. The New York Central is in a quite different situation as regards handling increased business from that of the Pennsylvania Railroad. It is estimated by those who are in closest touch with the operation of the Central that in connection with its two tracks on the west shore of the Hudson river, it could handle 35 per cent. greater ton mileage than it is now handling without materially increasing any of its facilities except to add more cars and engines.

The following table shows the results of operation in 1910, as compared with 1909:

	1910.	1909.
Average mileage operated	3,785	3,782
Freight revenue	\$58,411,234	\$54,449,281
Passenger revenue	30,992,856	29,001,911
Total operating revenue	99,908,498	93,171,861
Maintenance of way and structures	14,060,178	11,494,023
Maintenance of equipment	16,936,253	15,421,648
Taxes	2,487,228	2,273,828
Transportation	37,938,527	33,309,315
Total operating expenses	74,079,087	64,593,826
Taxes	4,697,826	4,434,504
Operating income	21,012,787	24,349,498
Gross corporate income	36,459,120	35,742,357
Net corporate income	14,288,672	13,695,420
Dividends	13,363,758	8,931,600
Surplus	924,914	4,763,820

This surplus was appropriated for additions and betterments in 1910.

LAKE SHORE & MICHIGAN SOUTHERN.

MANY of the conditions which affected the operations and earnings of the New York Central & Hudson River, commented on elsewhere, also tended to increase the expenses of the Lake Shore & Michigan Southern out of proportion to the increased business handled, but the report for the calendar year ended December 31, 1910, shows two conditions that affect the Lake Shore individually. From a financial standpoint, the Lake Shore at the end of 1910 was in need of cash, which need has been supplied, since January 1, at least in part, by the sale of \$15,000,000 bonds. From an operating point of view, the Lake Shore apparently did not get as much out of its motive power in 1910 as it did in 1909.

The Lake Shore & Michigan Southern, operating 1,663 miles of road, earned in 1910 \$49,400,000, which is more by \$4,300,000 than the gross in 1909. Expenses, however, totaled \$34,900,000 last year, which is an increase of \$6,900,000 over the year before, and makes the operating ratio 70.66 per cent. in 1910 as compared with 62.12 per cent. in 1909. After the payment of 18 per cent. dividends in 1910, which called for \$8,900,000, the company had a surplus of \$4,900,000. In 1909 12 per cent. dividends were paid, calling for \$5,900,000, and leaving the company a surplus of \$6,980,000.

The comment made above, that the Lake Shore was not getting as much out of its power last year as it did the year before is borne out by the fact that while the company handled 6,243,000 revenue ton miles in 1910, which is an increase of slightly less than 9 per cent. over the ton mileage of 1909, the locomotive mileage for freight service totaled 11,890,000, which

is an increase over 1909 of slightly over 14 per cent., and revenue freight train miles amounted to 10,500,000, or about 14 per cent. more than in 1909. The average train load was 593.6 tons, a decrease of 30.6 tons from the average for 1909. Even with this decrease, however, the Lake Shore's train load is an impressive figure. Car loading was better in 1910 than in 1909, but there were on an average fewer loaded cars per train and also fewer empty cars per train, which would seem to indicate quite clearly that the locomotives were hauling less on an average last year than the year before. The Lake Shore's freight density, was 3,803,178 in 1910. The average receipts per ton per mile last year were 5.23 mills and 5.18 mills the year before. The receipts per passenger per mile averaged 1.866 cents in 1910 and 1.818 cents in 1909.

A large proportion of the Lake Shore's tonnage is low grade commodities. Out of the total of 37,000,000 tons hauled in 1910, 9,700,000 tons was bituminous coal, which is an increase over the tonnage of this commodity in 1909 of 1,700,000 tons; and 6,400,000 tons was ore, which is an increase in the tonnage of this commodity over 1909 of 940,000 tons.

Attention has been called over and over again to the large sums the company has put back into its property from net earnings, and how high its standards of maintenance are, but it is only fair in any discussion of the operation of the property to repeat this comment. Last year \$4,600,000 was spent for improvements and additions to roadway and bridges, and charged to capital account, and \$1,700,000 was spent for stations and other structures, the principal item being \$1,080,000 spent on the Ashtabula harbor and dock improvements. In addition, the company charged to income \$1,400,000 for payments on the 1907 and 1910 trust equipment notes of the New York Central Lines.

Maintenance of way and structures cost \$7,500,000, an increase over 1909 of \$2,100,000. Maintenance of equipment cost \$7,900,000, an increase of \$1,100,000, and transportation expenses amounted to \$17,400,000, an increase of \$3,500,000. President Brown says: "In maintenance of way and structures there were included large expenditures for ballasting 315 miles of main line track with stone, changing traffic from left-hand to right-hand running, and general repairs and renewals of bridge structures, buildings and fixtures. There was also a large increase of maintenance of roadway and track expenses due to additional main track built and resulting greater mileage of main tracks to maintain. Maintenance of way employees were granted an increase in wages in the early part of the year, which added \$297,761 to maintenance expenses."

The following table shows the unit costs of maintenance as worked out on the usual method used in these comments:

	1910.	1909.
*Maintenance of way and structures per mile of track	\$2,276	\$1,771
†Repairs per locomotive.....	2,429	1,895
†Repairs per passenger car.....	982	765
†Repairs per freight car.....	63	78

*According to the *Railway Age Gazette* formula, track mileage is obtained by adding together all first, second, third, etc., main and branch line tracks and one-half the mileage of switch tracks and sidings.

†Repairs only, and does not include renewals, overhead charges or depreciation.

The need for additional cash, previously mentioned, is very strikingly shown by an examination of the balance sheet as of December 31, 1910. While working assets are shown at the very impressive figure of \$123,400,000, cash amounts to but \$4,290,000, and the principal item under working assets is \$97,600,000 marketable securities. The marketable securities of the Lake Shore are a very valuable asset, but it is hardly conceivable that the company would choose to raise money by the sale of these securities. In 1910 working liabilities amounted to \$17,000,000, which included \$10,200,000 loans and bills payable. In 1909 cash on hand amounted to \$13,998,000, and working liabilities \$8,300,000, of which \$1,700,000 was loans and bills payable. During 1910 the company borrowed \$8,500,000 on its notes

payable March 15, 1911, and presumably the sale of \$15,000,000 bonds since January 1, provided for the payment of these notes.

During the year the company bought a half interest in the Kanawha & Michigan, and all of the Toledo & Ohio Central outstanding stock, and sold its one-sixth interest in the Hocking Valley stock to the Chesapeake & Ohio. This gives the Lake Shore a line of its own from Toledo south to a connection with the Kanawha & Michigan, and a joint line from that point south to the Ohio river and to a connection with the Chesapeake & Ohio. Across the river from the terminus of the Kanawha & Michigan is the northern terminus of the Virginian, and there is a clause in the agreement between the Lake Shore & Michigan Southern and the Chesapeake & Ohio which provides that if either company desires it and the Virginian and the Kanawha & Michigan each pay one-half of the cost, a bridge may be built across the Ohio river to connect the Rogers road with the K. & M. During the year there have been various rumors of the Vanderbilt lines desiring to acquire roads south of the Ohio river, but so far as is generally known, nothing has actually been done with this in view.

The traffic agreement between the Pittsburgh & Lake Erie, a Lake Shore subsidiary, and the Western Maryland was commented on in our discussion of last year's Lake Shore report. During 1910 the 90-mile line connecting the Western Maryland and the Pittsburgh & Lake Erie has been built, and was described in the *Railway Age Gazette* of February 10 and 17.

The following table shows the results of operation in 1910 as compared with 1909:

	1910.	1909.
Average mileage operated	1,663	1,663
Freight revenue	\$32,646,536	\$29,735,277
Passenger revenue	11,130,125	10,154,220
Total operating revenue.....	49,420,211	45,110,997
Maintenance of way and structures	7,549,661	5,468,363
Maintenance of equipment.....	7,873,217	6,811,551
Traffic	1,153,165	1,101,596
Transportation	17,442,858	13,914,957
Total operating expenses.....	34,920,933	28,023,661
Taxes	1,720,182	1,458,905
Operating income	12,729,380	15,549,524
Gross corporate income.....	23,181,467	21,763,790
Net corporate income.....	13,787,035	12,917,548
Dividends	8,903,970	5,935,980
*Equipment	1,365,297	1,263,186
Surplus	3,517,768	5,718,382

*In 1909 this was for additional equipment, and in 1910 was for the installments due on 1907 and 1910 equipment trust certificates.

MICHIGAN CENTRAL.

IN commenting elsewhere on the showing of the New York Central & Hudson River in 1910, mention is made of the increase in expenses being due to both the increase in the wage rate and the increase due to a larger number of names on the pay-roll. This is well illustrated by the report of the Michigan Central, which separates the increases in labor cost as between these two causes. For instance, under maintenance of way and structures, increased expenditures for labor amounted to \$378,000, of which \$213,000 was due to the increased rates of pay. Under maintenance of equipment the increased account of labor amounted to \$171,000, of which \$74,000 was due to increased rates of pay, and under transportation expenses, the increased account of labor amounted to \$1,347,000, of which \$459,000 was due to increased rates of pay.

In 1910 total operating revenues on the Michigan Central, from the operation of 1,803 miles, amounted to \$29,700,000, an increase over 1909 of \$2,300,000, and operating expenses of the year amounted to \$21,600,000, an increase of \$3,100,000. The operating ratio was 42.84 per cent. in 1910 and 67.48 per cent. in 1909. The Michigan Central, unlike the New York Central and the Lake Shore, does not own large amounts of stock in other companies, nor does it own a controlling interest in large subsidiaries. It was unable, therefore, to make up the loss in net through increased dividends received from subsidiaries or from other sources of income, so that after the payment of

its 6 per cent. dividends, which called for \$1,124,280, its surplus in 1910 was \$593,000, as against \$2,300,000 in 1909.

The Detroit river tunnel was opened last year, and has been in operation for regular freight and passenger service since October 16, 1910. The total cost of this tunnel, including interest on money advanced for construction, was \$8,900,000, this after the payment of an estimated \$200,000 for additional work still to be completed. The acquisition of terminal freight and passenger yards, and station buildings by the tunnel company will require a considerable sum in addition to the amount above mentioned.

The Michigan Central's share of the equipment acquired under the New York Central Lines' equipment trust of 1910 was 67 locomotives, 13 passenger train cars and 3,298 freight train cars. The cost of maintenance of equipment in 1910 was \$4,124,000, which was \$368,000 more than maintenance of equipment cost in 1909. The following table shows the unit costs of maintenance:

	1910.	1909.
*Maintenance of way and structures per mile of track	\$1,377	\$1,179
†Repairs per locomotive	2,523	2,162
‡Repairs per passenger car	573	549
§Repairs per freight car	105	100

*According to the *Railway Age Gazette* formula, track mileage is obtained by adding together all first, second, third, etc., main and branch line tracks and one-half of the mileage of switch tracks and sidings.

†Repairs only, and does not include renewals, overhead charges or depreciation.

Maintenance of way and structures cost \$4,035,000, or \$577,000 more than in 1909. Last year the company laid 12,246 tons of 100-lb. rail as against 20,975 tons in 1909; and placed in track 1,072,719 ties, mostly oak and chestnut. In 1909 there were placed in track 910,814 ties. The cost to Michigan Central of its ties is naturally comparatively light, but it is worth noting that the average price at distributing points last year was 69 cents, as against 61 cents the year before. It may be recalled that the Interstate Commerce Commission in its opinion in the Western Rate case brushed aside rather lightly the argument of the roads that the price of materials was continually increasing, but increases like the one just mentioned, while small in themselves, can foot up to an enormous sum when taken in the aggregate.

The Michigan Central has a light traffic density as compared with the three other New York Central lines whose reports we have reviewed. Last year the ton mileage was 3,261,000,000 tons one mile, an increase of 219,600,000 tons, or about 5 per cent., and the freight density last year was 1,700,000 tons one mile per mile of road. The average train load was 419 tons, as compared with 406 tons in 1909. The average receipts per ton per mile were 6.29 mills last year and 6.26 mills the year before. The better train loading is probably due to a greater proportion of low grade heavy commodities and also to a smaller empty freight car mileage. The mileage of locomotives in freight service was 8,400,000 in 1910, an increase of but about 2.4 per cent.

Passenger revenue on the Michigan Central furnishes a greater proportion of total than on the average road in the West. In 1910 passenger revenue amounted to \$7,400,000, an increase of \$749,000 over 1909, and express revenue amounted to \$1,500,000, an increase of \$275,000. The increase in passenger revenue, the report says, was due to a large excursion travel, and general improvement in both local and interline business. The total number of passenger carried one mile last year was 373,000,000, which is about 9.4 per cent. more than in 1909, the average receipts per passenger per mile being 1.983 cents in 1910 and 1.95 cents in 1909. Passenger locomotive miles totaled 6,600,000, or about 9.1 per cent. more than in 1909.

There was considerable curiosity at the time, some few months ago, when the Michigan Central placed a loan of \$10,000,000 in France, as to what interest the company had to pay for its money. The only mention of this loan in the

annual report is in the profit and loss account, which shows a debit of \$240,355, "for discount, commission and expenses in connection with the New York Central Lines' equipment trust certificates of 1910, Michigan Central-Grand River Valley bonds and Michigan Central one-year francs notes."

The balance sheet shows loans and bills payable of \$18,100,000 on December 31, 1910. This compares with the loans and bills payable of \$4,450,000 at the end of 1909. Total working assets amounted to \$10,173,000 at the end of 1910, with total working liabilities of \$23,400,000, which included the bills payable mentioned above. Working assets at the end of 1909 amounted to \$10,960,000, and working liabilities to \$9,400,000.

During the year the company sold \$1,500,000 Michigan Central Grand River Valley bonds, and assumed its share of the liability for the New York Central Lines' \$30,000,000 equipment trust certificates, which in the case of the M. C. amounted to \$8,500,000. The company retired at maturity on February 1, 1910, \$10,000,000 3-year 5 per cent. notes.

The following table shows the operations of the company in 1910 compared with 1909:

	1910.	1909.
Average mileage operated	1,803	1,746
Freight revenue	\$19,282,288	\$18,267,530
Passenger revenue	7,404,476	6,655,699
Total operating revenue	29,694,816	27,415,467
Maintenance of way and structures	4,035,261	3,458,165
Maintenance of equipment	4,124,366	3,756,582
Traffic	882,151	777,668
Transportation	12,023,589	10,050,690
Total operating expenses	21,628,906	18,499,528
Taxes	1,357,020	1,121,532
Operating income	6,652,574	7,743,255
Gross corporate income	7,746,254	8,684,736
Net corporate income	1,717,331	3,421,422
Dividends	1,124,280	1,124,280
*Equipment	250,000	548,925
Surplus	343,051	1,748,217

*This was for additional equipment in 1909 and on account of 1910 proportion of New York Central Lines 1907 and 1910 equipment trust certificates in 1910.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.

THE lines of the Cleveland, Cincinnati, Chicago & St. Louis run through as highly competitive territory as any in the United States. They connect such cities as Cleveland, Cincinnati, Toledo, Indianapolis, St. Louis and Chicago, and the rates that this company and its competitors in this territory can charge have in the past been forced down to the lowest possible minimum through the keenness of the competition. In this territory the management of the railway and the character of the service is so largely dictated by competitive conditions that the management of any one individual road has little or no choice as to what shall be done. As President Brown points out in his letter accompanying the annual report of the C. C. C. & St. L., for the year ended December 31, 1910, the Interstate Commerce Commission in refusing to grant increase in rates, did not take into consideration such roads as the Big Four, and it is just such roads which more than any others clearly illustrate one point that the railway attorneys and witnesses strongly insisted on. This was that freight rates are now too low and have been too low in the past.

In 1910, operating 1,982 miles of road, the Big Four earned \$30,400,000, but was able to save for net only \$6,900,000, the operating ratio being 77.23 per cent., as against an operating ratio of 71.27 per cent. in 1909. Operating income, after the payment of taxes and the deficit from outside operations, amounted to \$5,880,000 in 1910, and to \$7,000,000 in 1909. After the payment of rentals, interest charges and 5 per cent. dividends on preferred stock, and 2 per cent. on common stock, the Big Four had a surplus of \$34,371 in 1910, as against \$1,335,000 in 1909.

The average revenue per ton per mile of the C. C. C. & St. L. is 5.46 mills, which is very slightly greater than the average in 1909. Since freight rates cannot be raised, the only way of

reducing operating costs is either to reduce maintenance and up-keep charges, or to make such changes in the method of handling freight and passengers as will effect economies. As has been pointed out, this is particularly difficult to do in the territory served by the C. C. C. & St. L., but at the present time there is an attempt being made by the roads operating in part of this territory to handle their freight in larger train loads and to move it slower. Naturally, this sort of a reform must be carried out by all the roads competing, and it is very likely to be strongly opposed by shippers.

It would seem that in a case like this one a function of the Interstate Commerce Commission, which that commission has heretofore never taken very seriously so far as we know, might well be exercised to great advantage. That is, to protect the roads against the shippers. We are not forgetting what the Interstate Commerce Commission claims it has done through the abolition of rebates, but there is some doubt as to how much credit the commission should have for this and how much credit rightfully belongs to certain strong railway presidents. In any case, here in the territory served by the C. C. C. & St. L., the commission might find a good opportunity to try its hand at something new in the way of regulation.

Maintenance charges on the C. C. C. & St. L., as a whole increased by \$1,299,826 in 1910, while transportation expenses increased by \$2,300,000. Transportation expenses totaled \$12,700,000 in 1910, and consumed 41.82 per cent. of operating revenue. One reason why these expenses were so high in 1910 was that fuel cost 11 cents per ton less in 1909 than in 1910, and the handling and storing of coal was considerably more expensive during the coal miners' strike.

The following table shows the unit of maintenance prepared in accordance with the formula generally used in these comments:

	1910.	1909.
*Maintenance of way and structures per track mile.....	\$1,427	\$1,158
†Repairs per locomotive.....	3,615	2,787
†Repairs per passenger car.....	820	708
†Repairs per freight car.....	94	84

*Per mile of first, second and third track, two miles of switch tracks and sidings being taken as equal to one mile of main or branch line tracks.
†For repairs only; does not include renewals, depreciation or overhead charges.

Of the increase in maintenance of way expenditures, most of the additional money spent was for rails, ties and other track material. Twenty-one thousand tons of 90-lb. rail were laid in 1910, as against 5,000 tons of rail laid in 1909. There were 978,520 ties put in track in 1910, of which about two-thirds were treated and one-third were oak. In 1909 there were 887,323 ties put in track, about the same number of treated ties being used as in 1910, but fewer oak ties being used. The average price at distributing points was 76.80 cents in 1910 and 73.00 cents in 1909.

During the year the company sold \$1,000,000 general mortgage bonds and 50,000,000 francs (\$9,650,000) 20-year 4 per cent. debenture bonds of 1910-1930. The balance sheet at the end of 1910 shows total working assets of \$9,046,000, of which \$2,866,000 was cash; and working liabilities of \$5,756,000, with no loans or bills payable. In 1909 there was on hand \$2,630,000 cash and working liabilities of \$7,273,000, which included \$3,000,000 loans and bills payable.

The following table shows the results of operation in 1910 as compared with 1909:

	1910.	1909.
Average mileage operated	1,982	1,982
Freight revenue	\$19,922,901	\$17,975,363
Passenger revenue	7,812,012	7,169,670
Total operating revenue	30,423,005	27,657,741
Maintenance of way and structures	3,934,281	3,159,609
Maintenance of equipment	5,177,765	4,652,610
Traffic	998,697	914,505
Transportation	12,724,100	10,434,269
Total operating expenses.....	23,495,620	19,711,495
Taxes	949,548	878,328
Operating income	5,879,655	7,011,380
Gross corporate income	6,700,469	7,634,613
Net corporate income	1,475,497	2,776,372
Dividends	1,441,126	1,441,126
Surplus	34,371	1,335,246

NEW BOOKS.

Scientific Management. By Louis D. Brandeis. Published by the Engineering Magazine, New York. 92 pages; 6½ in. x 9¼ in. Cloth. Price, \$2.

This volume reproduces that portion of Mr. Brandeis' brief which relates to scientific management and which was submitted to the Interstate Commerce Commission in the recent rate hearing at Washington. It is a digest of the testimony given by Harrington Emerson, H. L. Gantt, Frank B. Gilbreth, H. L. Hathaway, James M. Dodge, Henry R. Towne, H. V. Scheel, Charles B. Going and others, and relates largely to the profitable results from the use of efficiency methods, which are claimed to have been accomplished by manufacturing concerns, and which the above mentioned gentlemen believe can accomplish equally gratifying results if applied to the operation of railways.

Railroad Field Geometry. By Wm. G. Raymond, professor of civil engineering and dean of college of applied science, State University of Iowa. New York: John Wiley & Sons. Morocco, 255 pages and 136 figures, 4 in. x 6½ in. Price, \$2.

This book is intended primarily for class room use, and embodies the results of Professor Raymond's 25 years' experience as an instructor. The author goes into the discussion of the various problems more fully than is customary in some works, to fix in the student's mind the connection between the theory and its application to practical problems. Problems most commonly met with in the field are discussed, and are illustrated in several cases by photographs to bring out the points the author is endeavoring to develop. The chapters covering the re-running of old lines and right-of-way descriptions are new for books of this kind, filling an existing want of the student. More than usual space is given to the subject of earth work computations, mass diagrams and over-haul. None of the customary field tables are included.

The Earning Power of Railroads, 1911 edition. Edited by Floyd W. Mundy, of James H. Oliphant & Co., New York. Published by Moody's Magazine book department, 35 Nassau street. Cloth. Price \$2.50.

The Earning Power of Railroads for 1911 covers 150 of the principal railway systems of the United States, Canada and Mexico. The mileage, capitalization, earnings over a period of years, operating expenses, maintenance costs, operating ratio, etc., are given, and earnings and expenses, etc., are also worked out on a mileage basis. In addition to the statistical tables the book includes 292 pages of classified notes giving information as to dividend and bond issues. The ten preliminary chapters explain the fundamental principles to be applied by investors in the study of the tables. The 1911 edition is considerably larger than the previous editions and gives figures for a number of roads not heretofore covered. The greatest usefulness of the book lies in the handiness with which the figures may be gotten at.

Electric Railway Transportation. The American Academy of Political and Social Science, Philadelphia, 1911. 200 pages; 7 in. x 10 in. Price, \$1.00.

The January, 1911, number of the *Annals of the American Academy of Political and Social Science* is devoted almost entirely to Electric Railway Transportation. Part I considers traffic and financial problems, and Part II, the public regulation of electric railways. The various articles were written by experts in their respective fields, and include The Urban Transportation Problem, by Bion J. Arnold; The Decreasing Financial Returns Upon Urban Street Railway Properties, by Thomas Conway, Jr.; The Depreciation Problem, by Wm. B. Jackson; Methods of Increasing the Efficiency of Surface Lines in Large Cities, by Williston Fish; The Investigation of Traffic Possibilities of Proposed Subway Lines, by Wm. S. Twining; Possibilities of Freight Traffic on Interurban Lines, by Frank S. Cummins; Express Business on Interurban Lines, by A. Eastman; Economy Factors in the Selection of Cars for Urban Service, by Samuel M. Curwen; The Relations of the Electric Railway Company to Its Employees, by C. D. Emmons; The Strike Problem on Electric Railways, by Daniel T. Pierce;

Educating the Public to a Proper Appreciation of Urban Street Railway Problems, by A. W. Warnock; The Presentation of Interurban Problems to the Public, by A. D. M. Van Zandt. Under Part II public relations are treated as follows: Valuation of Intangible Street Railway Property, by Frank R. Ford; The Indeterminate Permit as a Satisfactory Franchise, by William Osgood Morgan; State Supervision of Electric Railways in Wisconsin, by B. H. Meyer; The Fruits of Public Regulation in New York, by Milo R. Maltbie; Supervising Engineers and Street Railway Service, by George Weston. While this volume is in paper cover and is part of the proceedings of an association, it will probably be so highly valued by those interested in either the financial or operating departments of electric street railways that they will find it worthy of a cloth binding and a place in their libraries.

Letters to the Editor.

EFFECT OF UNDULATING GRADES ON TRAIN VELOCITY.

NEW YORK, March 15, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The article On the Effect of Undulating Grades, by F. S. Foote, Jr., in your issue of March 10, is most interesting, but the inference which may be drawn from his opening statement, that writers on railway location and engineers generally accept unreservedly Mr. Wellington's theory on this matter, is hardly warranted. It was long ago recognized that Wellington's theory should only be applied with great caution; in fact the writer went so far as to advocate (Railroad Location, Surveys and Estimates, page 124) that not over 50 per cent. of the values given in Wellington's table of velocity heads should be used in calculating the operating cost of undulating grades, unless extremely good reasons could be shown for using higher values.

Mr. Foote adopts the results of Prof. Schmidt's experiments, which seem to show that resistance increases with the velocity. The American Railway Engineering & Maintenance of Way Association, together with many prominent engineers, seem inclined to favor the theory that resistance does *not* increase with the velocity at ordinary freight train speeds. It seems to the writer that the variations in operating conditions are so great, and there are so many factors which cannot be expressed in figures and which will vary with different roads and different conditions, that the slight theoretical difference shown by Mr. Foote should only be considered as a mathematical demonstration of one of these factors under certain conditions, and that to be on the safe side, it is advisable to have a great deal more leeway than is shown by Mr. Foote as necessary. FRED LAVIS.

TELEPHONES FOR TRAIN DESPATCHING.

FORT SCOTT, KAN., February 15, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Referring to an article in the *Railway Age Gazette* of January 13, under the caption, "A Despatcher Who Does Not Like the Telephone," I would like to offer my experience for the benefit of your readers who may have been prejudiced against the use of the telephone for train despatching by the article mentioned. I have been despatching trains for 22 years by telegraph and have been on many of the heavy tricks throughout the west. I looked upon the advent of the telephone into the train despatching field with many misgivings, but can now say enthusiastically, "Give me the 'phone." I have given the telephone a thorough try-out covering a period of 10 months, and my views seem to be in direct contradiction to the experience of the writer of that article. I will answer each of his objections in the order in which they appear.

I find that operators answer the 'phone bell much more promptly than they did the telegraph, for the logical reason that they can hear it at a much greater distance. They can hear it on the freight platform, or in the freight house, which is not true of the telegraph, and there are few operators who will deliberately refuse to answer with reasonable promptness when they hear the despatcher calling. Another factor in getting an operator to answer the 'phone is the fact that helpers, who may not be telegraphers, can hear the 'phone ring, and call the operator from distant places. This company has a circuit for the "train despatcher only," and when an operator hears the bell on this circuit ring (the message circuit bell having a different tone) he knows that the despatcher wants him, either for orders or messages pertinent to the movement of trains.

I find no difficulty whatever in "breaking" operators on the 'phone whenever necessary, and have not yet found it necessary to have an operator repeat "an entire order" on account of being unable to "break him." I have found it quite handy to be able to take "O S" and get other information from operators while the selector is working and find no trouble in holding the man called while I finish any other business that may have "come in on the line" while the selector was working, or in telling the operator who "came in" to "wait a minute" if that suits me better.

I am interrupted frequently throughout the day, and have had no trouble in holding either, or both operators, as the case demanded. I simply tell them to "wait a minute," adding what for, which takes but a few seconds, not nearly as long as it takes to "stand an operator off" on the telegraph.

Questions on my circuit are no more numerous now than they were on the telegraph, and I can certainly answer them more quickly, and more satisfactorily, and I can answer them while leaning back in my chair without moving.

I am always glad to give operators information regarding trains, and as they are required to keep their bulletin boards posted, I do not think any despatcher should consider such questions "troublesome."

It is true that "all telephone circuits are installed with a set of rules," ours being no exception. We enforce those rules, therefore the despatchers are not "troubled with roundhouse foremen, roadmasters, etc.," using their circuits for promiscuous service. This matter is entirely within the regulation of the despatcher himself, for no person but the despatcher can "call" or "ring" on his circuit, as he has the only "selector" on the circuit.

On an average, messages can be handled as rapidly on the 'phone as on the telegraph, and I have it from the manager of the telegraph office that they are handling as many messages on the "local 'phone circuit" as were handled on the local telegraph circuit, and in addition leaving plenty of time for long distance conversations between the division officers and general offices, thereby eliminating a vast amount of telegraphing that would otherwise go over the through telegraph lines.

With the installation of the 'phone, the despatcher's troubles with sleepy operators have become a thing of the past, and our records will show that not one operator has been reprimanded or dismissed for "sleeping on duty" since the 'phones were installed on this division. I would like to see the color of the operator's hair who would cut out the 'phone bell, admitting that he knew how, in order to sleep undisturbed.

My "halter" is long enough to allow me to reach the water cooler, the window or either of the other two despatchers without "cutting out," but should I desire to go further, it takes but a second to slip the plug from the "jack box" and go where I will, for while I am "cut out" if an operator wants me, he simply turns a crank on his generator a couple of turns, and rings my bell.

I have also found that the 'phone not only reduces the physical strain at least one half, but largely increases my capacity without adding to that strain.

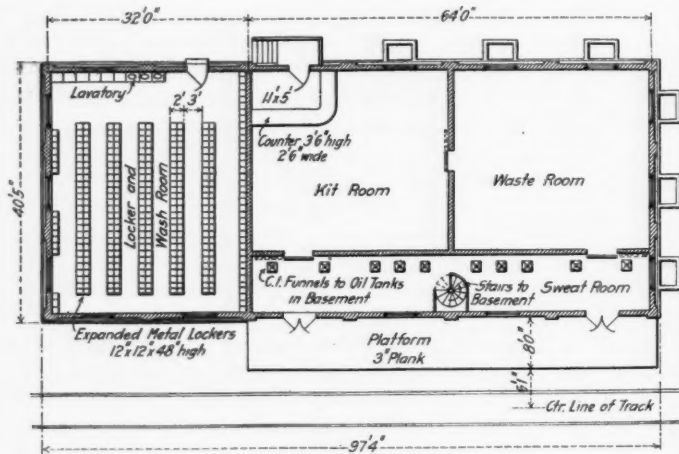
W. C. BARANGER,
Despatcher, St. Louis & San Francisco.

STRUCTURES AT NORTHUMBERLAND YARD; PENNSYLVANIA RAILROAD.*

BY WILLIAM FORSYTH,
Associate Editor, *Railway Age Gazette*.

LOCOMOTIVE TERMINAL.

Near the center of the yard and directly south of the east-bound classification tracks is the large locomotive terminal with its ample storage yards, engine house, machine shop, power plant and other auxiliary structures. The storage yard is graded for 15 tracks, each 1,000 ft. long; 5 tracks will be laid for coal storage and 7 for locomotives. The two inspection pits are located 1,400 ft. from the engine house portal and the four ash pits 800 ft. from the same point. Both the inspection and the ash pits are similar to those previously constructed by the Pennsylvania Railroad, and already described in detail in articles on

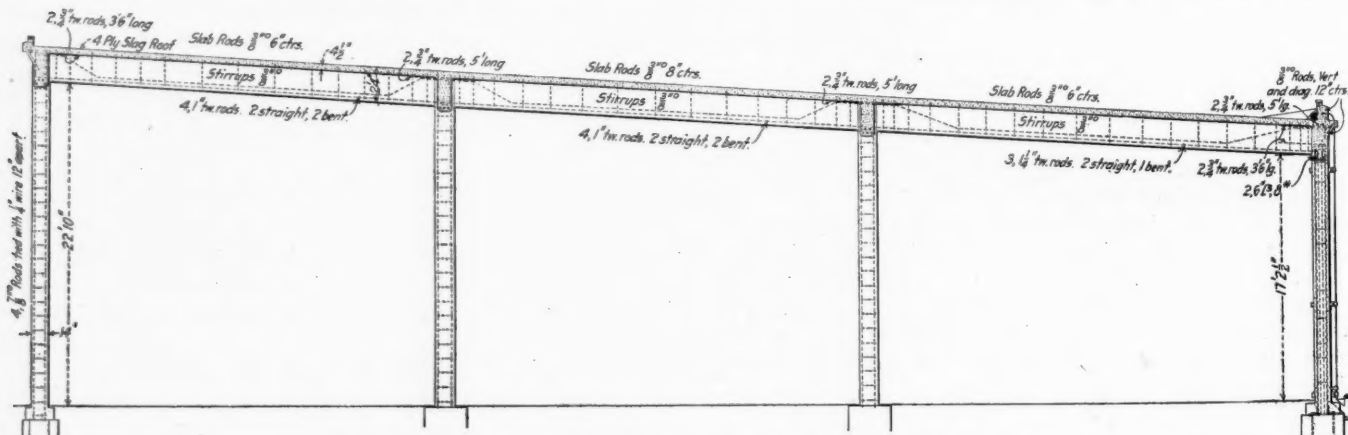


Arrangement of the Oil House.

the East Altoona locomotive terminal in the *Railway Age* of January 19, 1906, page 86, and *The Railroad Gazette*, March 16, 1906, page 259. The inspection pits are 75 ft. long and 3 ft. 6 in. deep from the top of the rail; they are connected at the center by an underground passage 3 ft. wide. The ash pits, 230 ft. long, have concrete walls, with box ribbed cast iron caps for the rail supports. They are 4 ft. deep and have track rails at the bottom for small dump ash cars, which are hoisted by 10-in. air cylinders suspended from steel bridges. There are two of these bridges crossing each pair of pits.

The oil house is a substantial brick building with concrete floors and an asbestos shingle roof. It is 40 ft. x 97 ft., with a basement 11 ft. 5 in. high for the large cylindrical oil storage tanks. The main floor is divided into four compartments, as shown on the drawing; a space 30 ft. x 40 ft. for a locker room; a kit room, 31 ft. x 32 ft., for hand tools and oil cans; a waste

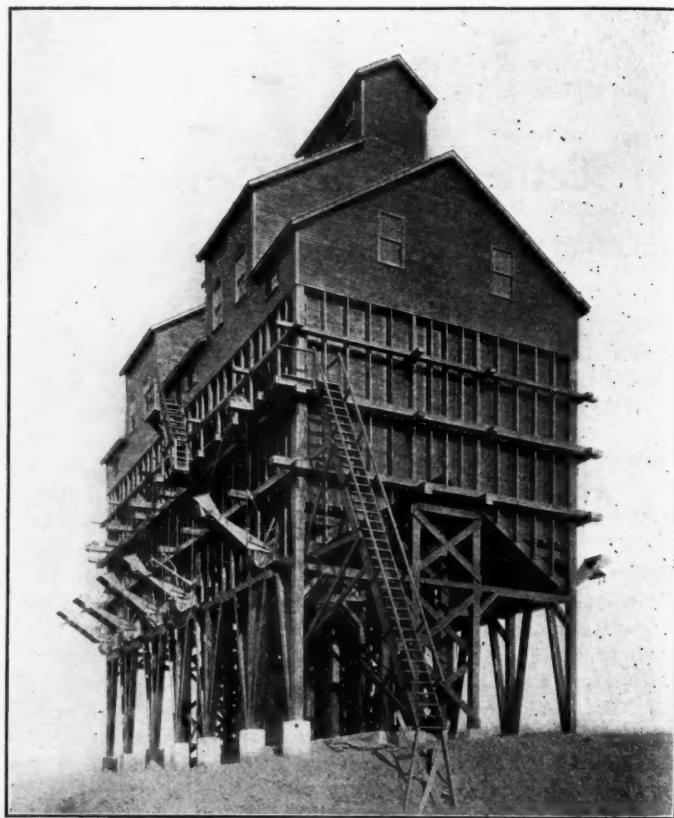
*A general description of this yard appeared in our issue of March 17.



Cross-Section Through Engine House Showing Roof Construction.

room, also 31 ft. x 32 ft., and an oil room, 8 1/2 ft. x 63 ft., where the measuring faucets and funnels are located. The oil is raised from the basement by air pressure. The eight large tanks have a capacity of 4,100 gal.

The coal wharf was designed and built by the Roberts & Schaefer Company, Chicago. It is equipped with duplicate hoisting equipment, consisting of two pairs of 2 1/2-ton Holmen buckets with their operating mechanism. There are two receiving hoppers each 24 ft. in length, the coal being fed from the receiving hoppers to the Holmen buckets by means of Barrett re-



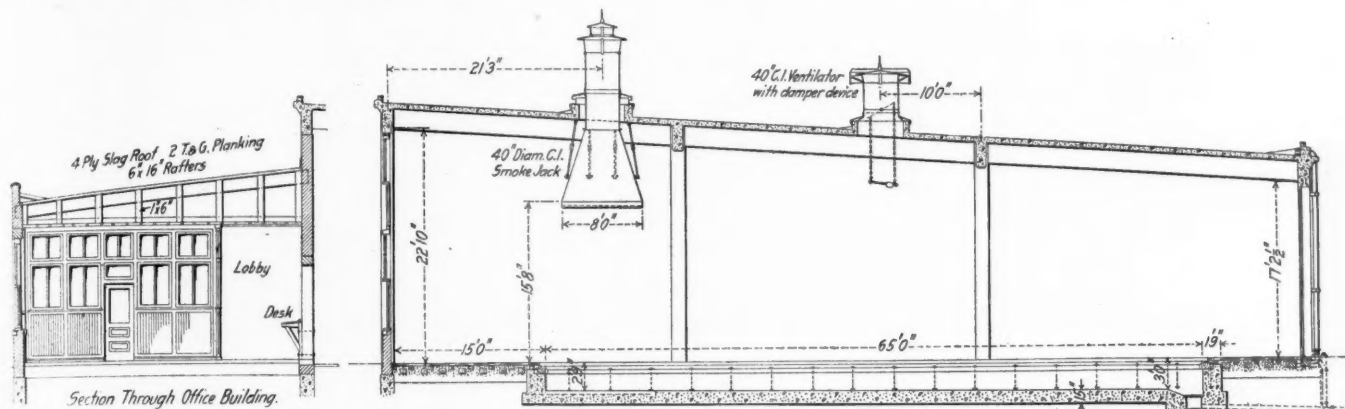
Coaling Station at Northumberland Yard.

volving feeders. The overhead storage pocket is divided into eight compartments for passenger coal, freight coal and wet sand. The bin has a total storage capacity for 1,000 tons of coal and 100 tons of wet sand. The hoisting equipment is so arranged and the bin is so divided that each pair of buckets handles and properly distributes freight coal and passenger coal, and in addition one pair of buckets handles the wet sand.

The overhead pocket delivers coal and sand to two tracks, one on either side of the pocket, and each side is provided with five

coaling aprons and one sand spout. Underneath the overhead wet sand pockets, which have concrete floors, are two sand dryers in fireproof compartments. The sand gravitates through the dryers over the screens, and into air drums, from which it is elevated to dry sand tanks overhead. From these tanks the dry sand is supplied to the locomotives as required. The hoisting equipment is operated by electric motors of a special type, pro-

The columns at the inner circle have a core of steel forming a built-up post, to which is attached the castings for the door hinges. These castings have holes at each edge of the column, so that although the doors are arranged to swing in they may be arranged to swing out in case more room is desired. This steel inner post is entirely covered with concrete, making a column 11 in. x 13 in. outside. The next intermediate column is



Engine House Construction Showing Arrangement of Smoke Jack and Ventilator.

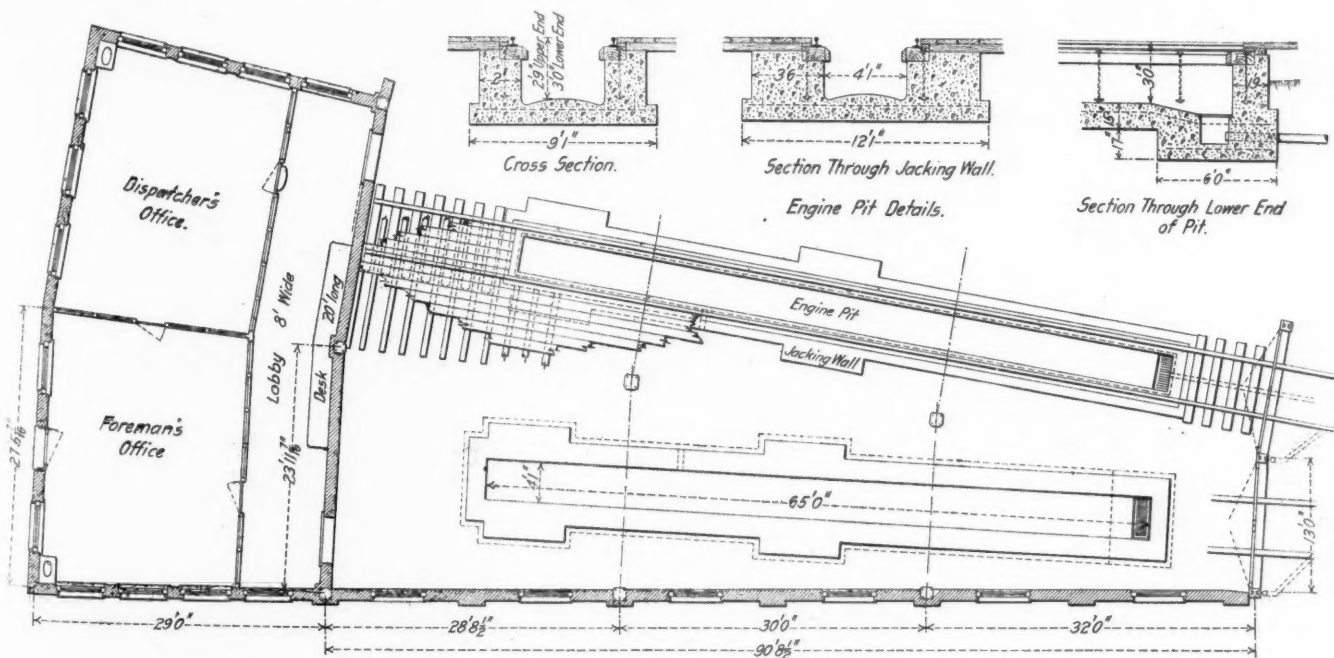
vided with specially designed limit devices to prevent accidents to the machinery.

ENGINE HOUSE.

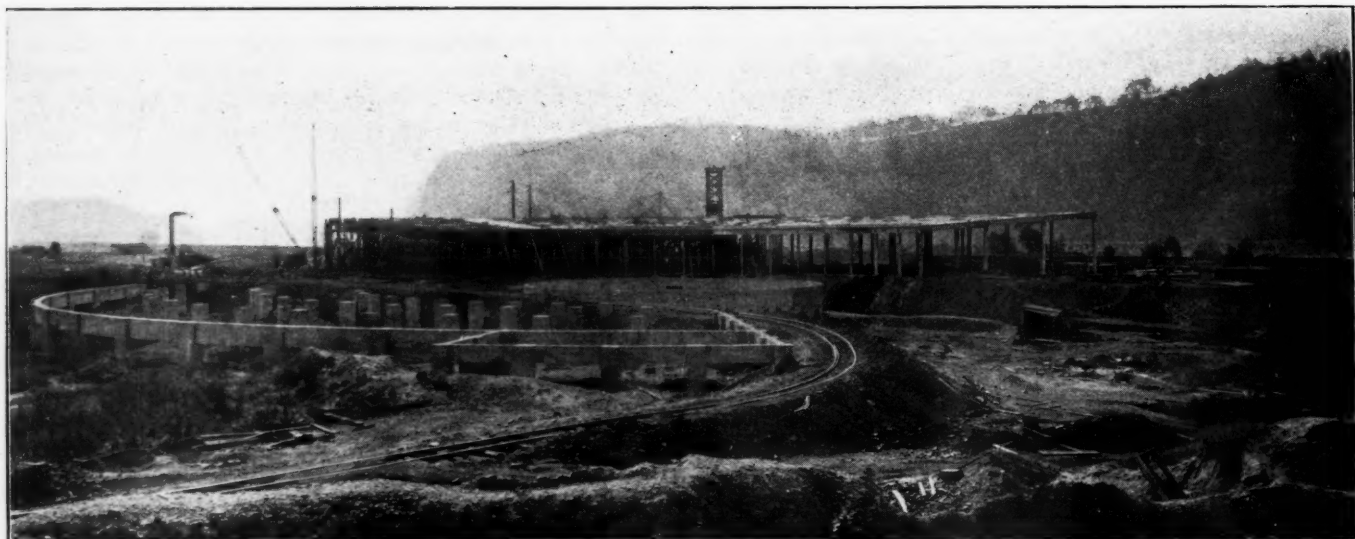
The engine house has been designed for an ultimate capacity of 52 stalls; 36 stalls have been built. The turntable is 100 ft. in diameter; the distance from the center of the table to the inside wall is 107 ft. 7 $\frac{7}{8}$ in., and the width of the house, center to center of walls is 90 ft. 8 $\frac{1}{2}$ in. The contractors for the engine house, power house and machine shop were Brann, Stuart & Company, Philadelphia, Pa., and the cost of the engine house above the foundation piers was \$84,000. The building is entirely fireproof and is constructed almost wholly of concrete. The spaces between the pilasters are filled in with brick, and the glazed sash are all steel. An unusual feature is the concrete roof, which is 4 $\frac{1}{2}$ in. thick and is ribbed up box-shaped at the openings for the ventilators and smokejacks. The house is 22 ft. 10 in. high from the floor to the under side of roof beams at the outer circumference. There is a straight slope in the roof to the inner wall, where the height is 16 ft. 8 in. clear.

15 in. square, and the one next the outer wall is 16 in. square. These columns and the reinforced concrete roof beams, as well as the roof itself, are shown in detail on the drawings and are worthy of careful attention, as they represent the latest practice of the Pennsylvania Railroad in the construction of engine houses. The cast iron ventilators and jacks are also shown on one of the drawings. The jack is fixed and the lower portion of the hood is 8 ft. long and 40 in. wide; the diameter of the circular part above the roof is 40 in. In the central panel of the house there is a cast iron ventilator 40 in. in diameter over each pit with a damper operated by chains and a sliding weight on a bar. These jacks and ventilators were supplied by Paul Dickinson, Inc., Chicago.

The pits, which are shown in detail on the drawings, are entirely of concrete and are 3 ft. deep at the lower end. The pit rails rest on 8 in. x 12 in. white oak stringers, which are bolted to the wall and extend over the pit to protect the radiating pipes. The pit walls are widened at the outer end and at the center to provide additional support for jacking up the locomotives. One



Engine House Pit Construction and Plan of Extension Containing Offices; Northumberland Yard.



Concrete Engine House Showing a Part of It Under Roof.

pit track passes through the outer wall to the machine shop. The drop wheel pits are grouped around this track. One large 80-in. drop wheel pit extends underneath it and the track on either side. On one side beyond this large pit is another pit for 62-in. wheels, extending under two tracks, and on the other side is a pit for 47-in. wheels under two tracks. This latter is intended for engine truck wheels. These pits are similar in construction and differ only in the size of the pneumatic jacks used. The arrangement of the jack and its truck for the 62-in. wheel pit is shown in detail. The pits for the jacks are circular, and, as may be seen, there is a separate jack for each three positions. After the wheels are dropped on the pit truck the jack disappears into its pit and the truck may then be rolled

to other positions. When over the central jack the wheels can be raised to the shop floor. Next to the pit for the engine truck wheels is a large drop table 55 ft. long, which is operated by large screws and an electric motor similar to that at the East Altoona engine house.

The turntable is to be operated by a 22 h. p. electric motor, the mechanism for which was supplied by George P. Nichols & Bro., Chicago. The house will be heated by 2-in. coils in the pits and around the outer walls, and will be lighted by 37 arc lamps. An extension at one end of the engine house is used for the offices of the foreman and the despatcher. This is 29 ft. wide and extends along two stalls, making each office 23 ft. long. There is a lobby 8 ft. wide between the engine



Concrete Foundations for Engine House; Northumberland Yard.

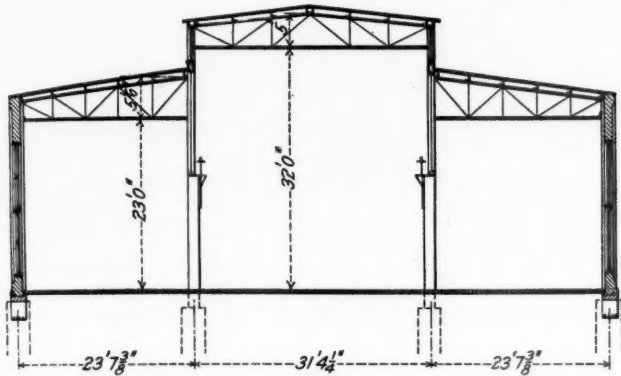
house and the offices. It has two doors, one into each office, and a desk 20 ft. long along the wall of the house. There is an opening in the office partition for engineers to register.

SHOP BUILDING.

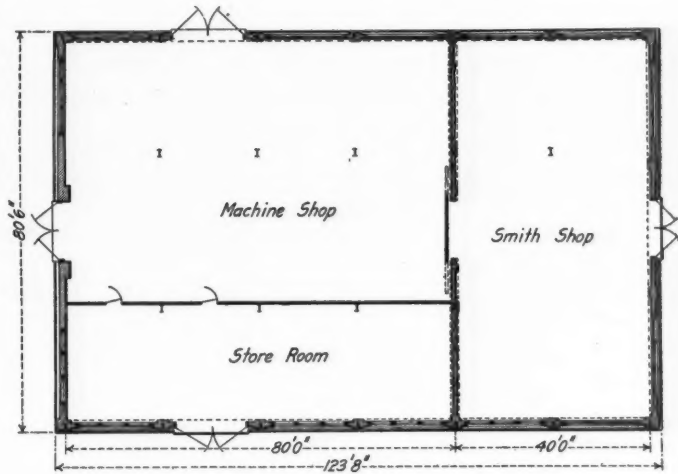
The shop building is a brick and steel structure 123 ft. 8 in. x 80 ft. 6 in. outside. It is divided into three rooms. One of these is for the machine shop proper, 53 ft. x 79 ft. inside. The smith shop extends entirely across one end and is 40 ft. x 80 ft.; there is a storeroom 24 ft. x 79 ft. in the same building. The building has a raised roof at the center, in which will be a small traveling crane with a span of 29 ft. 3 in. The exterior

WATER SUPPLY.

The water supply for the shops and yards will be from two sources, one for drinking purposes from the Molly Bullion spring, which has a capacity of 225,000 gal. in 24 hours, the other for boilers and condensation from the Susquehanna river. The main water pipes extending through the yards will be supplied from the spring under normal conditions, but they are fitted



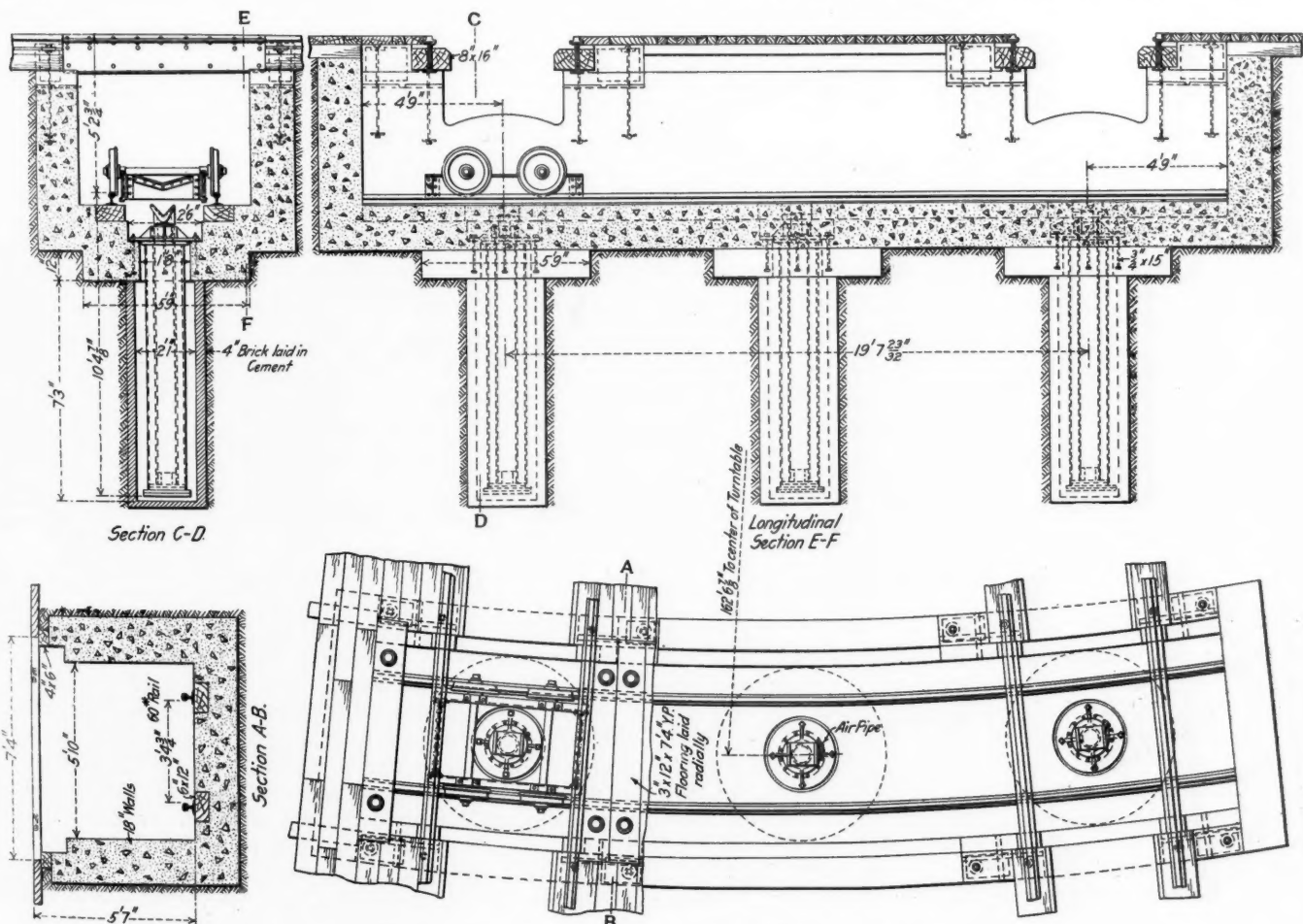
Cross-Section Through the Shop Building.



Plan of the Shop Building.

wall at the machine shop end has an opening, so that this crane may pass to the material yard outside, where the crane girders are supported on a steel structure. The side walls of the building are filled almost entirely with glazed sash and the end walls also have very large windows, so that the shop will be well lighted.

with check valves so that in case of fire it will be possible to put on a higher pressure of 100 lbs. per sq. in. and supply a larger volume of water from the river. There are four steel tubs, each of 50,000 gal. capacity, on structural steel supports, all on the same level of 85 ft. At the center of the power house is a deep pit for the pumps which have their suction pipes be-



Drop Pit for Trailing Truck Wheels; Northumberland Engine House.

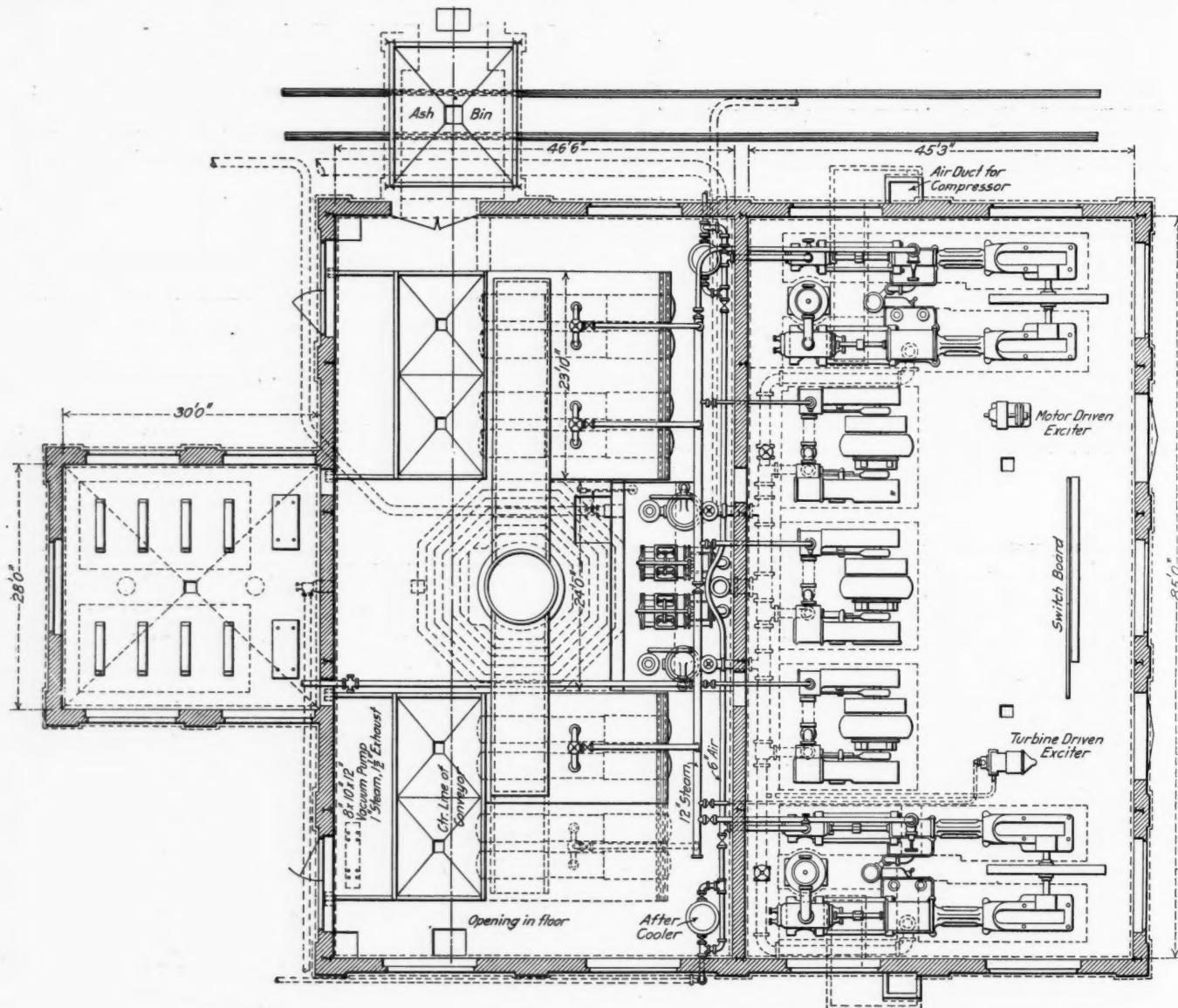
low the river level. The water flows by gravity from the river through a 20-in. cast iron pipe to a sump under the pumps.

POWER HOUSE.

The power house is a brick structure similar in architecture to the machine shop. It is 85 ft. x 92 ft. 9 in. inside with an extension on the engine house side 28 ft. x 30 ft. for the boiler washing plant. The engine room is 45 ft. 3 in. x 85 ft., and is 28 ft. 3 in. from the floor to the under side of the roof truss. The room is spanned by a hand power traveling crane with a capacity of 10 tons. The height from the floor to the top of the rail on the longitudinal crane girders is 21 ft. 6 in. There are

tional boiler of the same size. Green chain grates are provided; the basement is arranged with partition walls, so that a large part of the drip of good coal from the grates will pass to the conveyor and be used again, while only the consumed coal dropping from the end of the chain grates will go to the ashpit proper. This arrangement is shown in the cross sectional view of the power house.

The pump pit is equipped with two 16 in. x 12 in. x 10 in. duplex Worthington pumps for fire purposes, and two Dean 16 in. x 26 in. x 18 in. vertical direct-acting pumps for the regular water service. There is a combined vacuum and jet condenser at each pump. The operation of the coal conveyor and the ash



Plan of Power House at the Northumberland Yard; Pennsylvania Railroad.

three General Electric 250 k. v. a. 240-volt, 2-phase, 60-cycle generating sets. The engines have a capacity of 325 h. p. each and were supplied by the Harrisburg Machine Company. There are two Ingersoll-Rand air compressors, two-stage compound with automatically operated air valves and Corliss valve gear. Each of these has a capacity of 2,500 cu. ft. of free air per minute. This large provision of compressed air is principally for operating the switches at the hump tracks, and for pneumatic hoists in the engine house and shops. The brick-lined steel stack is 7 ft. in diameter inside and 185 ft. high. The boilers are of the Heine type, built by the Keeler Company, Williamsport, Pa. There are three of these, each with 4,000 sq. ft. of heating surface; floor space is provided for an addi-

conveyor is also indicated on the drawing; these were supplied by the Link-Belt Company of Philadelphia.

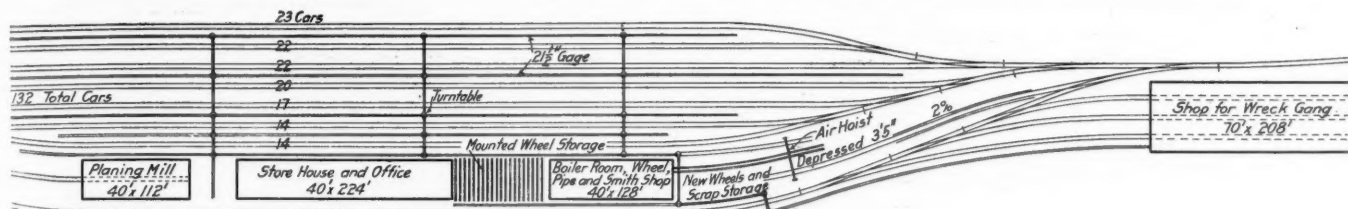
The plant for boiler washing was supplied by the National Boiler Washing Company of Chicago. It is guaranteed to blow out two locomotive boilers, wash two boilers and fill two boilers at the same time, and is capable of washing 30 locomotive boilers in 24 hours. The storage capacity for this system is 24,000 gal., and the pump capacity 1,000 gal. per minute. This is one of the largest boiler washing plants installed by the National company, which also installed the vacuum steam heating system for the roundhouse, a steam blower line and compressed air line in the same house, and the complete pneumatic oil house system, including tanks and accessories.

AUXILIARY STRUCTURES.

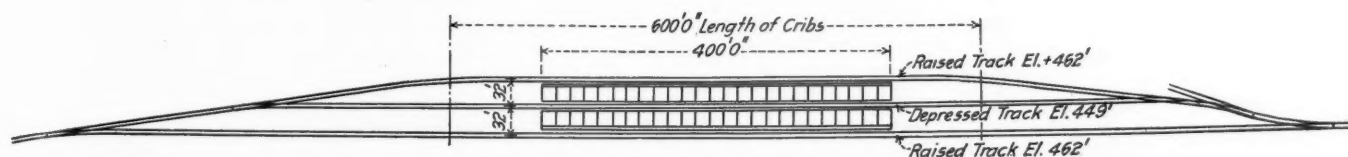
In addition to the larger permanent structures built of brick or concrete, which have just been described, there are a number of smaller auxiliary structures, most of them built of wood. These include the car repair shops, scrap bins, loaded car transfer, stock pens and the transfer sheds.

Car Repair Yards and Shops.—The car repair tracks and shops

structures 40 ft. wide. The planing mill is 112 ft. long; the storehouse and office, 224 ft. long; the boiler room, wheel, pipe and smith shop, 128 ft. long. A 100-ft. space between the storehouse and wheel shop is occupied by cross tracks for the storage of mounted wheels. The wheel shop will contain two axle lathes, one wheel press, two car wheel borers, and one steel-tired wheel lathe. New wheels and scrap are stored at the opposite end of



Car Repair Yard at Northumberland; Pennsylvania Railroad.



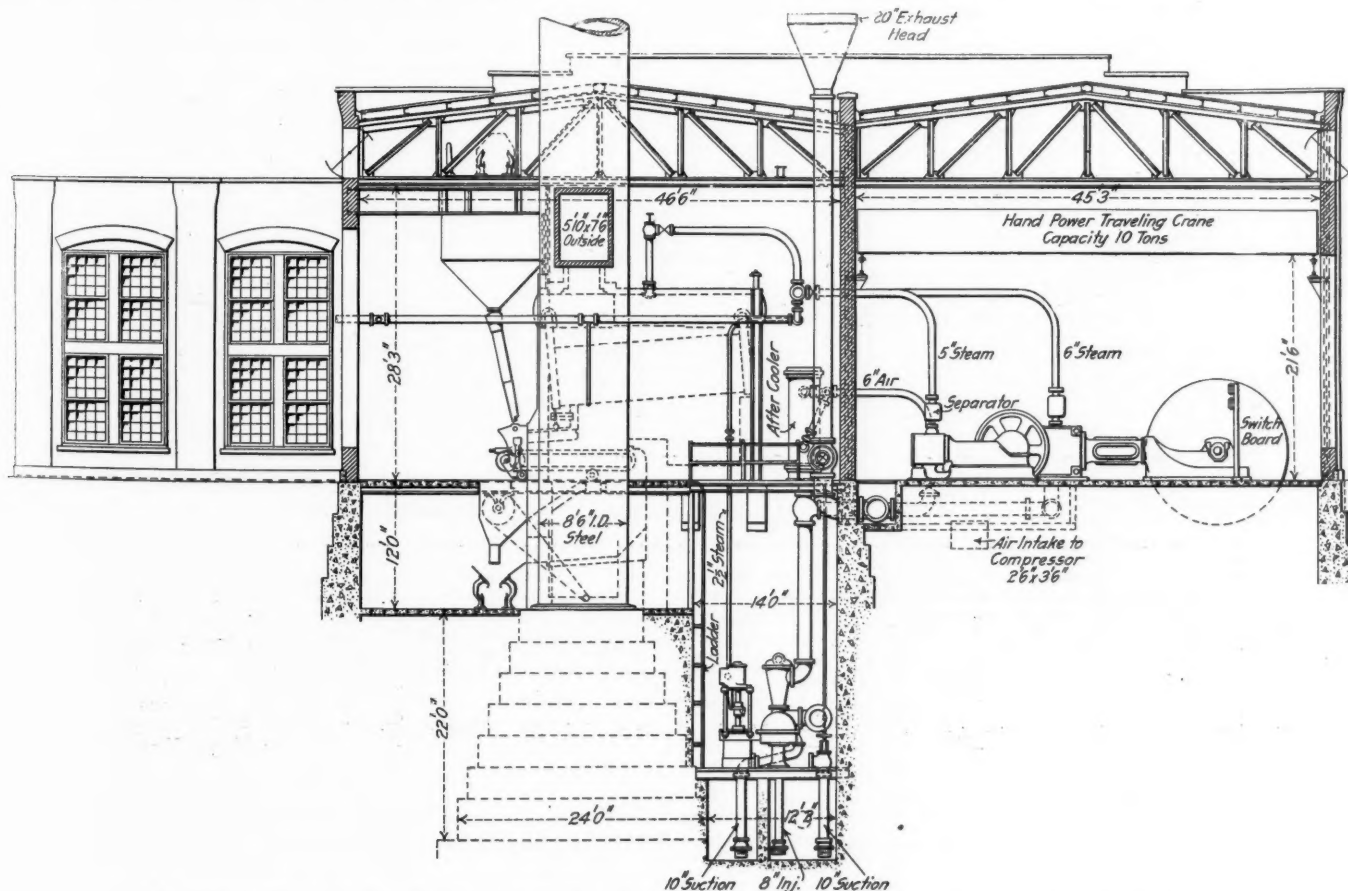
Arrangement of Tracks at the Scrap Bins.

are located between the westbound receiving tracks and the eastbound departure tracks; in this long space are also situated two yards for cripple cars and the large scrap bins. The general arrangement of the repair yard, showing the location of the car shops, is shown on one of the drawings. The tracks have a capacity for 132 cars, and are arranged on the south side of this yard. Between the alternate standard gage tracks are narrow gage tracks for the distribution of material to cars under repair, and there are two cross tracks leading to the shops with turntables at the intersections. The car shop buildings are all wooden

the wheel shop where there is a depressed track and an overhead structure fitted with an air hoist for transferring the wheels from the cars to the track entering the wheel shop.

Conveniently located near the yard entrance and also adjacent to the car shops, is a large building, 70 ft. x 208 ft., which is intended as a shop for the wreck gang. This shop has three through standard gage tracks and one narrow gage track connecting it with the car shops.

Scrap Bins.—The scrap bins, which are directly north of the car shops, are unusually large for a place of this kind, as it is



Section Through the Boiler and Engine Rooms of the Power House; Northumberland Yard.

ELECTRIFICATION OF STEAM ROADS.

The seventh annual electrical night of the New York Railroad Club was held last Friday evening and proved to be a big success. In contrast with the meetings of a few years ago, there was an almost entire absence of the controversial spirit, and one could not help but be impressed by the broader and more tolerant views which the electrical engineers are taking concerning the electrification of steam roads. W. J. Harahan, vice-president of the Erie, as chairman of the standing committee on electrification, stated that while much progress had been made in developing the details of the electrical equipment during the past year, there had been no important general development in the system of electrification. Several different systems have been in service on steam roads for a considerable time, and the committee invited a number of operating men to be present to tell of their experience.

James A. McCrea, general superintendent of the Long Island, was not able to be present but sent a communication. The traffic which had been developed on the western end of the road where the multiple system is in use had grown to such proportions that it could not possibly be handled in any other way. The multiple unit system is especially adapted for heavy suburban service. At the present time the Long Island has 62 miles of road operating electrically, including 164 miles of track. The system has proven thoroughly reliable. In five years there has been only one serious delay which could be charged to the electrical equipment. The motor troubles at the present time are slight, and the difficulties with the third rail are being overcome. Snow does not interfere with the operation of the road. Trains can be operated at a higher speed and on a shorter headway. It is, of course, necessary to make radical changes in the operation of the terminals from steam railway methods. The multiple unit system makes it possible to handle eight or ten trains per hour per track at the terminal, this good showing being largely due to the decreased amount of switching which is required. People who live in the suburbs do not want to spend more than 60 minutes in traveling to their work, and with steam operation this means that the suburbanites must live within a radius of 24 miles of their places of business. With the multiple unit operation it is possible to live at a 25 per cent. greater distance, or 30 miles away, and still keep within the time limit of one hour; or the time of going to and from the office may be shortened. In the operation of steam roads no special attention has been paid to the cost per car mile, but with the multiple unit system, where this cost is from six to eight cents, the operating men watch matters closely and do not use any more cars than necessary. With the multiple unit system the number of cars in a train may vary widely and is not limited by the capacity of a locomotive, as in the case of the steam roads.

Prof. George F. Swain, of Harvard University, who is a member of the Massachusetts Joint Board on Metropolitan Improvements, told in a most interesting way of how this board had considered the problem of electrification as applied to Boston and its suburbs. He treated the matter from the broad economic and financial standpoint and not as an electrical engineer. A summary of the conclusions of the Joint Board were published in the *Railway Age Gazette* of March 3 in connection with Mr. Seley's discussion of the paper on Locomotive Smoke in Chicago, presented before the Western Society of Engineers. Conditions in and about Boston are peculiar. Three main steam lines enter the city, but there are 21 lines or branches within a radius of from 10 to 15 miles from its center, which is as far as the suburban district extends. The public wants electrification because of the absence of smoke, the greater speed of trains and the improved values of real estate along the right of way due to the absence of smoke and noise. Electrification is of advantage to the railways in the saving of power; the reduction in locomotive repairs and the corrosion of overhead structures, which is quite a serious problem on steam roads because of the smoke

and gases from the engine; the utilization of the space over the terminal tracks for buildings, which is largely a real estate problem; and the saving in switching where the multiple unit system is used. With these facts in mind, the majority of the committee, after careful investigation and study, reported that it was not wise to enforce electrification by compulsion, for the following reasons.

The railways reported that it would cost \$40,000,000 to electrify for passenger traffic in the suburban district, which, as previously stated, covers an area from 10 to 15 minutes from the center of the city. In New York City the cost of electrifying two lines for a 30-mile radius was only half of this. It is difficult to electrify small branches or stubs as compared with longer lines. Very little is saved in the cost of steam operation where the road is electrified for a short distance, and the electric locomotives have to be exchanged for steam locomotives for the rest of the run; the cost of the electrical operation is practically added to it. The problem is, of course, different where it is possible to electrify an entire division so that it is not necessary to change the locomotives. If the railways electrified for passenger traffic by an expenditure of \$40,000,000 it would not remove the smoke nuisance, for it would still be necessary to handle the freight trains with steam locomotives. The New York Central and the New York, New Haven & Hartford report that the electrical operation, independent of the interest on capital, is not more economical than steam.

If by electrification the traffic could be greatly increased the rates would not be affected, but otherwise it would be necessary to increase them to bring a proper return on the investment. The conditions on the Long Island Railroad, where there is a heavy suburban service and the traffic is largely passenger, is very different from that at Boston, where the freight service is of much greater importance. If the state intends to compel the roads to electrify, then it should guarantee a return on the investment. The electrification would undoubtedly necessitate an increase in rates, and this would be hazardous in Boston because of the short length of the lines which it is proposed to electrify, and also because the same area is covered by competing electric street car lines and subway systems. An increase in rates would divert the traffic to the surface lines and the cost of electrification would therefore have to be charged against long distance traffic. Boston is an important port at the present time. It is much more expensive to take freight to Boston from the West than it is to take it to New York, for in the former case it has to be transported over mountain grades, while in the latter it follows the valley of the Hudson river. If this expense is increased, due to the cost of electrifying the lines at Boston, it will seriously affect the importance of Boston as a port. Professor Swain believes that the government regulation of railways is very good if not carried too far. It should control the issue of securities, insure the safe operation of the railways by the safety appliance laws, and control the freight and passenger trains. These are proper because they safeguard the interests of the public; but the electrification is a luxury. Can the public afford to pay for it?

Another reason which influenced the members of the Joint Board in making its majority report was the moral effect which its action would have. If one district or state demands electrification, others will be inclined to follow the example. This would require the expenditure of an enormous capital, but adequate returns on it would not be assured. The railways require a large amount of money annually to take care of their natural growth. If the states required electrification, it would be difficult to secure the necessary additional capital, because fair returns on it could not be promised. Another reason which actuated the joint board was the fact that the electrical engineers are not as yet agreed as to standards. Suppose the roads about Boston did electrify and each used a different system. There is no telling how soon certain combinations will take place which will make it extremely advisable to have all of the roads in that

district use the same system. Since the joint board made its report, a case of this kind has come up. The New Haven road has petitioned the Massachusetts state legislature to allow them to build a tunnel under the harbor in order to connect and operate its trains over a road which it previously had no direct connection, and until recently no one expected it ever would have. The minority report stated that the majority report would discourage electrification, but if the New Haven builds a tunnel underneath the harbor it will be absolutely necessary for them to operate it by electricity, and it would therefore seem that the minority report was wrong in its surmise. The question as to compulsory electrification is still before the legislature, but it is not to be hoped that it will decide against it.

H. Gilliam, electrical superintendent of the New York, New Haven & Hartford, said that in operating over the 33½ miles from the terminal, current was only used for 12 miles, or, during the 50 minutes required for covering the 33½ miles, current was only on for 17 minutes. He believed that by offering some special incentive, the engineers or motormen could reduce the amount of current used to a minimum, thereby decreasing the cost of operation. Heating the coaches by electricity had proven very satisfactory, as a uniform temperature could be maintained in each of the cars. Steam locomotive engineers can easily operate the electric locomotives by a few hours instruction a day for two weeks.

Wm. McClellan, another member of the committee on electrification, stated that very little progress had been made in electrification during the year from the standpoint of the electrical engineer. The side rod electric locomotives had been introduced on the Pennsylvania, but no data was as yet available concerning their performance. It had been his experience that the officers on steam operated roads which had electrified portions of the road were frank to admit that electrical operation was more reliable than steam. Three large systems are now operating electrically in and about New York City, and, in Mr. McClellan's opinion, the problem had passed beyond the experimental stage. Thus far no standards for the equipment or the system of electrification had been adopted. This matter should be thrashed out and a conclusion arrived at as soon as possible. It was useless for engineers to discuss the minor shortcomings of the systems which they were criticising, but in order to reach a proper conclusion it would be necessary for them to tell what they knew about the good and bad points of the system with which they were most familiar. In times past the advocates of the various systems had criticised the other systems because of complexity. The different systems had, however, all given successful service results and the argument of complexity was broken down. The engineers who had developed the different systems were enthusiastic about them. As they were equally reliable, the matter as to which system should be used should be decided entirely on the question of cost. This is not a local problem. It is impossible to tell when different roads will be combined, and the equipment of one may have to operate over the other. There will finally be one approved system, and the railways will eventually be put to an enormous expense if this question is decided in a haphazard manner. It cannot be decided until complete data for the various systems in operation is available. Thus far the railways have not thought it advisable to publish this data.

Frank J. Sprague stated that the electrification of steam roads was a private development and an economic problem, and the government should not interfere. The steam roads are not ready for electrification at the present time. There are other developments and improvements which must be attended to, and which are far more important than electrification. These developments will, however, all go to increase the efficiency of operation and to prepare for the final application of electrical operation. This will be some considerable time in the future, and at that time the electrical engineers will be far better prepared to decide what system is best fitted for the work. Mr. Sprague was

a member of a committee which studied the advisability of electrifying a division of the Southern Pacific over the Sierra Nevada mountains. The committee, after an exhaustive study of the problem, decided that it was advisable to electrify, and drew up specifications for the equipment to be used. It had been impossible to secure equipment from the manufacturers to the specifications, although it was expected that it might be possible to do so in the near future. In considering the electrification in a large city, such as Chicago, the municipal authorities and the railways should get together and select a thoroughly competent commission to investigate and report. The questions which the commission should consider would be, "Is it practical under the conditions to electrify? What will the financial result be, and how can it be done at a minimum of expense?"

W. S. Murray, electrical engineer of the New York, New Haven & Hartford, thought that the single phase system would prove to be the most economical for operating trunk line service under any conditions. The New Haven now has 100 miles of single track electrified between Woodlawn and Stamford. The operation over this division has proven so successful that the directors have ratified the electrification of a six-track Harlem branch and yards, so that all trains west of Stamford, both freight and passenger, will be operated by electricity. In the immediate budget, the electrification of over 372 miles of track has been authorized, including the electrification of the Hoosac tunnel. The conditions in this territory are diversified. While Mr. Murray believes that direct current is good for use in and about large cities, the conditions of trunk line service are absolutely different and should be handled by the single phase system. This system has always been found best where it was necessary to transmit great quantities of power and over long distances. The first cost of the single phase system is considerably less than that for other systems. It has proven perfectly reliable. The average delays for all electrically operated trains on the New Haven were such that a train could cover a distance equal to that from the Grand Central station to San Francisco and back 11 times with a delay of one minute.

W. B. Potter, of the General Electric Company, thought that the electrification of steam roads was an economic problem, and must be settled on that basis. He spoke at considerable length on the advantages of the self-propelled car in which a gasoline engine was used for operating an electric generator, thus supplying current for the electric motors. This system provides a greater flexibility of operation than does one in which a gasoline engine is used in connection with mechanical transmission. Experience had shown that where the self-propelled cars were used on branch lines, thus making a more frequent service possible, the amount of travel had greatly increased.

Mr. Zimmerman, who had been connected with the Spokane & Inland Empire, as a consulting engineer, stated that unfortunately conditions were so different on that road that it was practically impossible to get a fair comparison of the cost of operation of the direct current system as compared with the single phase, and that it was equally impossible to compare either one of these to steam because of the great difference in conditions under which the different parts of the road were operated. He did not believe it was necessary to standardize the system of electrification which should be used for trunk line service. At the present time, on many roads, the class of steam power used on one division is radically different from that used on others, and in many cases a steam locomotive from one division would not give satisfactory results on another. If steam locomotives do not go off the division, why should it be necessary to have the electric locomotives do so?

A. H. Armstrong, of the General Electric Company, thought that there was no question but what it would be economical to operate electrically on mountain grades. For a considerable time last year he had made a study of steam road conditions and found that when a locomotive was in operation, about 8 lbs. of coal were required per brake horse-power hour. If the standby

losses were taken into consideration, including the time that the locomotive was standing on sidings or idle, but still burning coal in order to keep up the fires, this amount would increase to 12 lbs. of coal per actual horse-power hour. A steam locomotive must be cleaned after it has run over the division, and it requires considerable attendance in the roundhouse for both cleaning and repairs. On the New York Central the electric locomotives run from 1,200 to 1,300 miles between inspections.

FREIGHT CAR TRUCK EXPERIMENTS.

A preliminary account of the tests of the friction of freight trucks on curves, made by Professor L. E. Endsley, of Purdue University, at Granite City, Ill., for the American Steel Foundries, was published in the *Railway Age Gazette* of December 2, 1910, page 1058. The complete results of these tests are now available and have been published in a handsome pamphlet. The purpose of the tests was to determine the difference in frictional resistance of loose and square trucks, a loose truck being one in which the side frames are free to move forward and backward parallel to each other, allowing the wheels on one side to get ahead of the wheels on the other side of the truck in going around a curve. A square truck is one in which some



Fig. 1—Incline Used for Starting Trucks.

form of construction is employed to hold the side frame from moving forward and backward, not allowing the wheels on one side to get ahead of those on the other side, and in this manner holding the truck square. Some trucks which were found loose were tested in this condition, after which they were squared and again tested.

The tests were conducted on a piece of experimental track located at the plant of the American Steel Foundries, Granite City, Ill. The track consisted of an incline having a drop of 36 ft. This incline is shown in Fig. 1 and has a short tangent of about 30 ft.; a 22 deg. curve of 303.3 ft., having a radius of 262 ft., the outer rail being raised $4\frac{1}{2}$ in. above the inner; a tangent of 257.2 ft.; and an incline having a vertical rise of about 20 ft. The gage of the track was 4 ft. $8\frac{1}{2}$ in. on the tangent and was increased to 4 ft. 9 in. on the curve. The incline was equipped with an electric hoist for pulling the truck up. By means of a figure four trip and a dead line, the truck could be released at any desired point. Later a second piece of straight track was constructed consisting of a tangent of 600 ft. which ran directly out from the incline, at the end of which was an incline having a rise of approximately 25 ft.

TRUCKS TESTED.

Different types of freight car trucks and different modifications of the same type of truck were tested. The trucks tested

were taken from under cars in regular service owned by 13 representative railways. Some 24 trucks were tested, including six specially constructed test trucks. All the trucks taken from cars, with the exception of one, were from cars of 100,000 lbs. capacity. All brake shoes and brake beams were removed prior

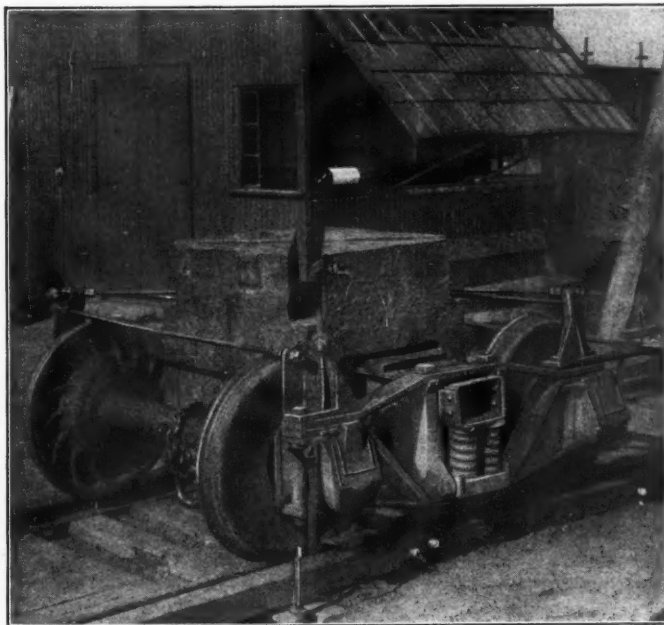


Fig. 2—Method of Holding Arch Bar Trucks Square.

to testing to eliminate any friction which might result from the contact of the shoe with the wheel. For convenience in recording data, the wheels were numbered 1, 2, 3 and 4. Wheels 1 and 2 were on one axle and 3 and 4 on the other axle. Nos. 1 and 2 were the wheels (when under the car) which were nearest the end of the car. By this method of numbering, wheels 1 and 3 were on the inner side of the curve when 1 and 2 were leading, and 2 and 4 were on the inside when 3 and 4

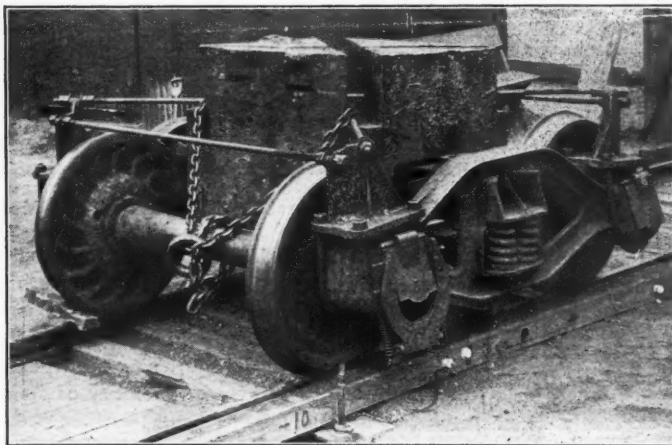


Fig. 3—Method of Holding Bettendorf Trucks Square.

were leading. It is, therefore, obvious that wheels 1 and 3 were on the same side of the track. In the further description of the trucks, the above notation of the wheels will be maintained. The 24 trucks tested on the curved track are designated by letters A to X, inclusive, and the three trucks tested on the 600-ft. tangent are designated by letters A, A₁ and A₂.

METHOD OF TESTING.

The truck was first weighed carefully, after which it was placed on the experimental track and pulled up the incline to the desired height, being released a number of times until the

distance the truck would run before stopping became constant. When the testing was on the curved track five record runs were then made. From these five record runs, the average velocity at the beginning and the end of the curve was determined. The same method was employed in obtaining the velocity on the tangent track at the end of the curve, with the exception that as this tangent was so short and the loss in velocity so small, the average of ten runs was used. The testing on the 600-ft. tangent track, which was level, was conducted by continuing the testing from four to six hours by alternately running the truck loose for two runs and square for two runs. The average distance of all the runs loose and all the runs square was taken as the performance of the truck in each condition.

All of the trucks tested on the curved track were tested with wheels 1 and 2 in front, and all but four were also tested with wheels 3 and 4 in front. Of the 18 trucks from railways tested

this distance was obtained from the record made on the drum; from this the velocity in feet per second was computed.

From the velocity obtained at different points along the track, in the method described above, the resistance in pounds per ton was obtained by the use of the following formulas:

$$K = \frac{V^2 W}{2g} + \frac{\left(V \frac{G}{R}\right)^2 W_1}{2g}$$

$$L = K_1 - K_2$$

$$F = \frac{L}{D}$$

$$P = \frac{F}{T}$$

Where

P = Force in pounds per ton.
V = Velocity of truck in feet per second.
W = Total weight of truck.

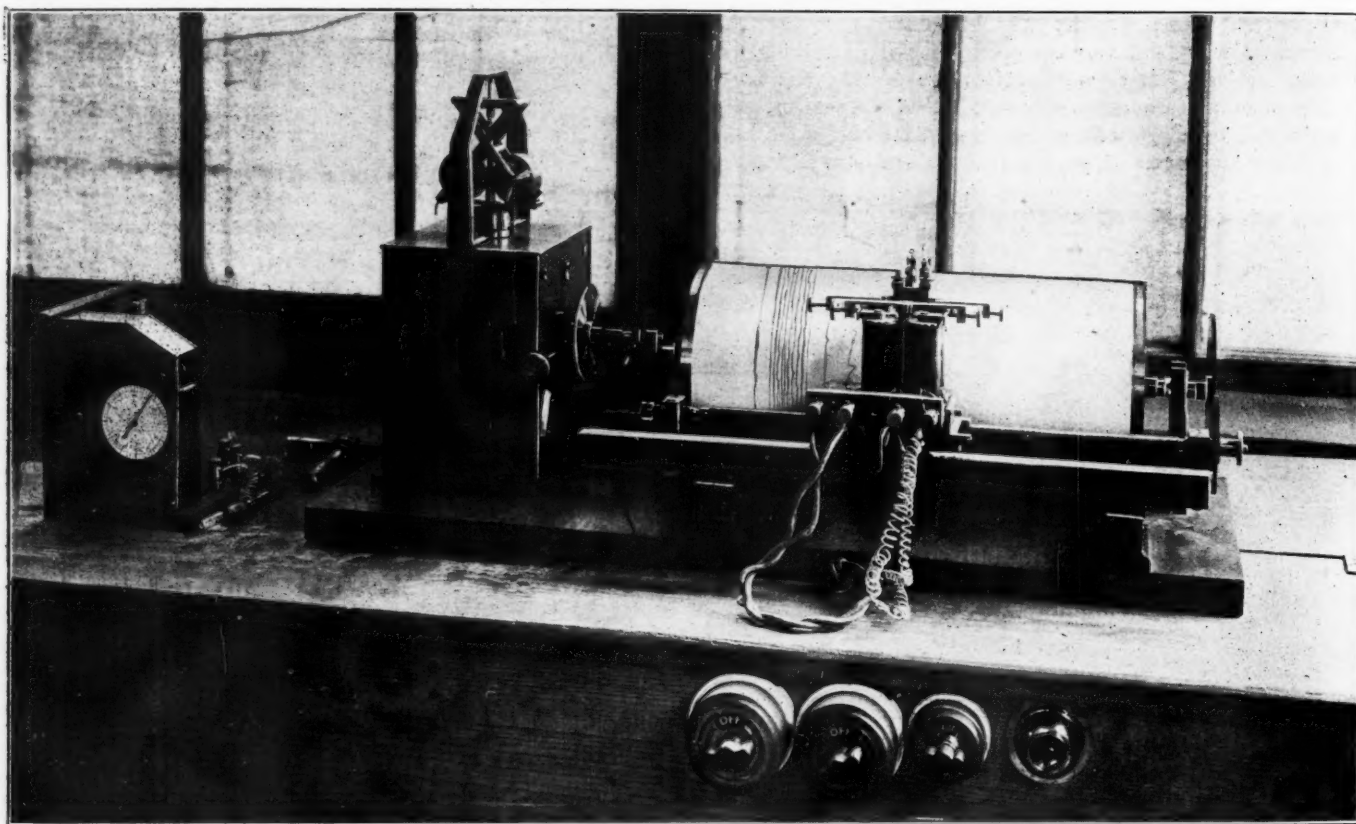


Fig. 4—Clock and Electric Chronograph for Measuring Speed; Freight Car Truck Experiments.

on the curved track, 7 of those found loose were squared and again tested. All of the experimental trucks were tested both loose and square. The method of squaring arch bar trucks is shown in Fig. 2, and for Bettendorf trucks in Fig. 3. Most of the tests on the curved track were conducted by raising the truck to a height which, when released, would give it a velocity of approximately 19 mi. per hr. at the foot of the incline. All of the tests on the 600-ft. tangent track were conducted at an initial speed of approximately 23.5 mi. per h., the exact velocities being shown in tables that accompany the report.

The velocity at any point was determined by means of an electric chronograph, which is shown in Fig. 4. The apparatus consists of a drum which can be driven at any constant velocity by a properly geared centrifugal governor (two pens, which are mounted on a transfer table of the machine, are driven by means of a screw, and draw spiral lines around the drum as it rotates. One of these pens was connected to a clock, by means of an electric current, which caused it to beat half seconds. The other pen was connected up with a track circuit), and as the truck passed the contact points on the track, this pen recorded it on the drum. These contact points were placed exactly 20 ft. apart, and the time that it took the truck to go

W_1 = Weight of wheels and axles.
 T = Weight of truck in tons.
 R = Radius of wheel in feet.
 K = Total kinetic energy.
 K_1 = Kinetic energy at any point of track.
 K_2 = Kinetic energy at another point of track.
 L = Loss of kinetic energy.
 D = Length of track in feet for which the loss in kinetic energy was obtained.
 F = Average force in pounds acting on the truck.
 G = Radius of gyration in feet of a pair of wheels and axles about the center line of the axle. It was necessary to know this radius of gyration in order to determine the kinetic energy in the truck due to the rotation of the wheels and axles. This was done experimentally by swinging a pair of wheels and axles as a pendulum and using the formulas,

$$t = \pi \sqrt{\frac{G_1^2}{gs}}$$

$$G^2 = G_1^2 - s^2 = \sqrt{\frac{t^2 gs}{\pi^2}} - s^2$$

In which

t = Time of a single oscillation.
 s = Distance in feet from center line of axle to the knife edge supports.
 G_1 = Radius of gyration about the point of support.

The radius of gyration as obtained for a pair of 700 lb. 33-in. cast-iron wheels and their axle was .573 ft., and for a pair of 33-in. Davis cast-steel wheels and axle was .559 ft.

The two methods used in determining the movement of one side frame with respect to the other, are shown in Fig. 5. One of these methods consisted of measuring the increase and decrease in length of the diagonal from the top of one journal box to the top of the other. This was done by having a wooden arm, carrying a pencil at one end, pivoted to the corner casting on the truck, reaching diagonally across to the other corner, as shown. A suitable board was fastened on the corner to which a card was attached. When the truck was about to be started down the incline, the pencil was placed in contact with the paper and lightly held there by a rubber hand. As the truck ran around the curve, this pencil would record the increase or decrease in length of the diagonal. Whether the diagonal was lengthened or shortened depended on the direction in which the truck was running. The diagonal on which this measuring device was arranged was such that if the truck was going out from the incline, the distance would be increased, and if the truck was coming back towards the incline, the distance would be shortened. As the pencil was in contact with the paper during a complete run of the truck, that is, during the time of running out to the further incline and back to the first incline, the total movement of the pencil on the paper recorded the difference between the maximum and minimum length of the diagonal. This motion recorded is only 74 per cent. of the total movement of one side frame with respect to the other. The reading of 74 per cent. was obtained by taking cards simultaneously on the diagonal as described above and on another apparatus at the end of the truck as shown in the same illustration. This second arrangement consisted in having two bars of iron fastened on top of the journal boxes. One of these bars had a 90 deg. bend which caused it to reach across the track as shown. It carried a suitable board on which a card could be fastened. The other bar of iron constituted a support for the free end of the first bar and was also equipped with a suitable arrangement for holding a pencil, as shown. This arrangement recorded the exact motion of one side frame with respect to the other.

One-half the length of this line as drawn on the paper as the truck passed around the curve and back again gives the

amount the truck went out of square in going around the curve.

It was found that as the trucks would go out of square the flanges of one wheel would not be in line with the flanges of the wheel in front of it. The arch bar truck in Fig. 6 is shown at rest about half way around the curve. A straight edge placed against the rim of the following wheel falls $2\frac{1}{4}$ in. away from the rim of the leading wheel. This indicates to what extent the loose truck may be out of alinement when passing around a curve.

Some of the results obtained on the curved track are given in Table I.* Column VIII gives the kinetic energy in foot-pounds that the truck had at the beginning of the curve. Column IX gives the kinetic energy at the end of the curve. Column X gives the loss in kinetic energy on the curve and is obtained by subtracting the values in Column IX from the values in Column VIII. Column XI gives the total average force in pounds on the truck. This was obtained by dividing the values in Column X by 303.3 ft., this being the length of the curve. Column XII gives the resistance in pounds per ton on the curved track. This was obtained by dividing the values in Column XI by the weight of the truck in tons. Column XIII gives the force in pounds on the truck, when on the curve, corrected for a level track. This was obtained by subtracting from the values in Column XII 25.7 lbs. This 25.7 lbs. is the force necessary to overcome the resistance due to the rise in grade. Column XIV gives the total movement of one side frame with respect to the other. These values were obtained by the methods described in a previous paragraph. One-half of the value given in this column is the amount that the truck gets out of square while going around the curve.

Truck A was an experimental arch bar truck, conforming closely to standard practice in its design and construction. This truck had a specially constructed cast-steel bolster which, being considerably heavier than commonly used, made the weight of the truck 12,520 lbs. No spring plank was used. The truck had 650 lbs. cast-iron wheels. The wheel base was 5 ft. 4 in.

*A number of tables are included in the report showing similar data for all the trucks tested on the curved track and on the tangent.

TABLE I.

Test No.	Truck	Wheels Front	Average Speed in Feet Per Second		Average Speed in Miles Per Hour		Kinetic Energy in Foot-Pounds		Loss in Kinetic Energy on Curve Ft.-Lbs.	Total Force on Truck on Curve Pounds	Resistance on Curve Lbs.-Ton	Resistance on Curve Corrected to Level Track Lbs.-Ton	Total Movement of Side Frame Inches
			At Beginning of Curve	At End of Curve	At Beginning of Curve	At End of Curve	At Beginning of Curve	At End of Curve					
I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
1	A	1 and 2	33.84	26.80	23.07	18.27	246,442	154,556	91,886	302.95	48.39	22.69	None
2	A	1 and 2	34.33	24.92	23.40	16.99	251,268	132,384	118,884	391.93	63.21	37.51	3.78
3	A	1 and 2	27.83	15.66	18.97	10.68	165,115	52,280	112,835	372.00	60.00	34.30	3.78
4	A	1 and 2	27.87	18.55	19.00	12.64	167,137	74,039	93,098	306.95	49.03	23.33	None
5	A	1 and 2	24.69	13.74	16.83	9.37	131,533	40,613	90,920	297.69	47.65	21.85	None
6	A	1 and 2	24.53	9.32	16.73	6.34	128,280	18,516	109,762	361.69	58.36	32.66	3.78
7	A	1 and 2	22.98	11.01	15.67	7.50	113,532	26,087	87,475	288.31	46.05	20.35	None
8	A	1 and 2	22.98	4.17	15.67	2.84	112,476	3,701	108,775	358.63	57.84	32.14	3.76
9	B	1 and 2	23.80	11.84	16.25	8.08	213,254	52,773	160,481	529.11	46.25	20.85	None
10	B	1 and 2	23.66	5.30	16.15	3.62	210,786	10,572	200,214	660.11	57.70	32.00	3.78
11	B	1 and 2	25.51	10.80	17.42	7.37	245,001	43,906	201,093	663.01	57.95	32.25	3.78
12	B	1 and 2	25.31	14.74	17.25	10.05	241,183	81,796	158,388	525.51	45.95	20.23	None
13	B	1 and 2	28.44	19.39	19.39	13.22	312,656	141,654	171,002	563.80	49.28	23.58	None
14	B	1 and 2	28.24	16.46	19.25	11.22	300,257	102,004	198,253	653.65	57.13	31.43	3.78
15	B	1 and 2	34.90	27.51	23.79	18.75	458,594	284,993	173,661	572.57	50.49	24.79	None

Although the wheels were cast several years ago, they were not worn, never having been in service except on the experimental track. The treads and flanges were in good condition. The wheels tapered larger than the standard 33-in. wheel by the fol-



Fig. 5—Methods Used to Determine the Movement of the Side Frames with Respect to each Other.

lowing amounts: No. 1, 1/16 in.; No. 2, 1/4 in.; No. 3, 1/2 in., and No. 4, 5/16 in. M. C. B. journal boxes and brasses were used. The boxes were freshly packed with cotton waste.

Truck B was the same as truck A, previously described, with the exception that a casting weighing 10,366 lbs. was added, thus making its total weight 22,866 lbs. In no other manner did truck B differ from truck A.

DISCUSSION OF RESULTS.

In order to show more clearly the relation between the resistance in pounds per ton on a curve and the amount that the truck gets out of square, the results of all tests on the curve track were plotted. The values were obtained by dividing the values in Column XIV of Table I, by 2, the assumption being

made that the amount that the truck went out of square is equal to one-half of the recorded movement of the side frames with respect to each other. During a number of tests an observer rode the truck and observed the movement of the recording pencil, which seemed to indicate that the amount that the truck went out of square was practically the same for both the outward and the inward trips around the curve. The results were plotted in the order in which the trucks went out of square and it is apparent that the friction in pounds per ton on the curve decreased in the same order. To more clearly show this, all of the results of tests have been separated into five groups. These groups were selected according to the amount that the trucks went out of square. The average resistance in pounds per ton for each group was plotted in Fig. 7. It will be seen that the average resistance in pounds per ton for all tests where the trucks went out of square more than 2 in. was



Fig. 6—Showing How the Wheels on a Loose Truck Get Out of Line Going Around a Curve.

39.7 lbs.; the average resistance in pounds per ton for all tests where the trucks went out of square between 1 1/2 in. and 2 in. was 36.8 lbs.; the average resistance in pounds per ton for all tests where the truck went out of square between 1 and 1 1/2 in. was 34.7 lbs.; the average resistance in pounds per ton for all

TABLE II.

1	DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11	12	13
2	Resistance, Pounds Per Ton, Loose Truck.....	7.83	9.28	10.73	12.18	13.64	15.09	16.54	17.99	19.45	20.90	22.35	23.80	25.25
3	Resistance, Pounds Per Ton, Square Truck.....	7.21	8.04	8.87	9.70	10.53	11.37	12.20	13.03	13.86	14.69	15.52	16.36	17.19
4	Pounds in Favor Square Truck.....	.62	1.24	1.86	2.48	3.11	3.72	4.34	4.96	5.59	6.21	6.83	7.44	8.06
5	Per Cent in Favor Square Truck.....	7.9	13.3	17.3	20.3	22.8	24.6	26.2	27.5	28.8	29.7	30.5	31.2	31.9
1	DEGREE OF CURVE	14	15	16	17	18	19	20	21	22	23	24	25	26
2	Resistance, Pounds Per Ton, Loose Truck.....	26.71	28.16	29.61	31.06	32.52	33.97	35.42	36.87	38.33	39.78	41.23	42.68	44.13
3	Resistance, Pounds Per Ton, Square Truck.....	18.02	18.85	19.68	20.52	21.35	22.18	23.01	23.84	24.68	25.51	26.34	27.17	28.00
4	Pounds in Favor Square Truck.....	8.69	9.31	9.93	10.54	11.17	11.79	12.41	13.03	13.65	14.27	14.89	15.51	16.13
5	Per Cent in Favor Square Truck.....	32.5	33.0	33.5	33.9	34.3	34.7	35.0	35.3	35.6	35.8	36.1	36.3	36.5

tests where the truck went out of square between $\frac{1}{2}$ and 1 in. dropped to 26.7 lbs.; and the resistance in pounds per ton for all tests where the truck went out of square less than $\frac{1}{2}$ in. was 24.6. It is evident that the amount that the truck went out of square had very little effect on the resistance in pounds per ton, until the truck was at least 1 in. out of square. The results obtained when the truck was out of square between 1 and $1\frac{1}{2}$ in. showed the increase in resistance to be 10.06 lbs. over

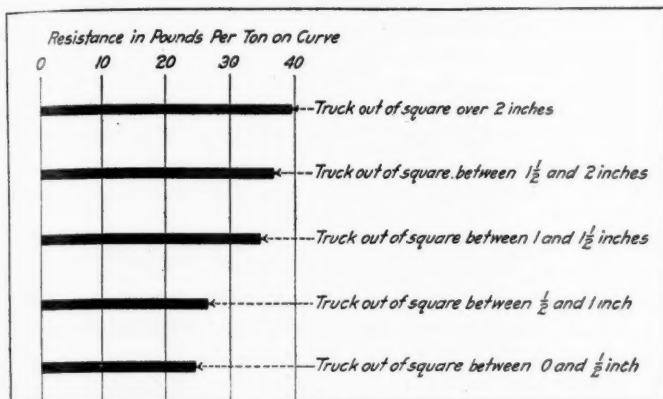


Fig. 7.—Average Resistance of Trucks for all Tests on the Curved Track.

the resistance offered when the trucks were out of square less than $\frac{1}{2}$ in.; so that there seems to be somewhere near 1 in. a point, such that if the truck gets out of square beyond it, the resistance in pounds per ton is materially increased. In order to distinguish between a square and loose truck, in view of the foregoing, it was assumed that all trucks tested that went out of square $\frac{1}{2}$ in. or less would be classed as square trucks, and all of those that went out of square more than $1\frac{1}{2}$ in. would be classed as loose trucks.

All of the values of the tests obtained for trucks that went out of square less than $\frac{1}{2}$ in. were averaged and a resistance of 24.68 lbs. per ton obtained. Also the result for all tests of loose trucks were averaged and a resistance of 38.33 lbs. per ton was

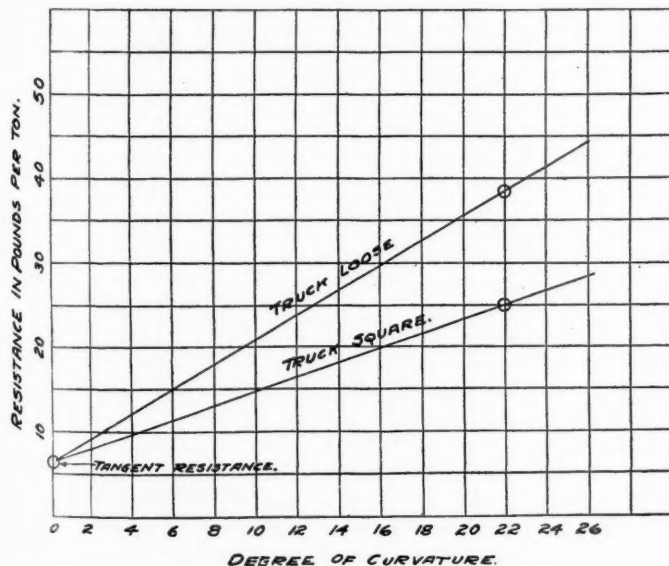


Fig. 8.—Resistance of Loose and Square Trucks for Different Degrees of Curvature.

obtained. These two average resistances for square and loose trucks have been plotted in Fig. 8, together with the average resistance on the short tangent, which resistance amounted to 6.38 lbs. per ton. With the tangent resistance as an origin, a straight line was drawn between the tangent resistance and the two curved resistances as shown, the upper line representing results for loose trucks or those getting out of square $1\frac{1}{2}$ in. or more, and the lower line representing the square truck or

those getting out of square $\frac{1}{2}$ in. or less. These two lines were drawn straight because it is generally accepted that the resistance due to curves is in direct proportion to the degree of curvature. From these two lines the results in Table 2 have been computed and the resistance for any degree of curvature up to 26 deg. is given. It will be seen from the values in Table 2 that the per cent. of saving in favor of the truck squared varies from 7.9 per cent. on a 1 deg. curve to 36.5 per cent. on a 26 deg. curve, and taking 4 deg. as the average main line curve, the saving is 20.3 per cent. in favor of the truck squared.

Those who have read the preliminary account of these tests may detect that the values do not exactly check the values given in Table 2. This is due to the fact that the table in the preliminary statement was based on the results of 15 tests of trucks loose and 15 tests of trucks squared, while Table 2 is based on the results of 45 tests of trucks square and 28 tests of trucks loose.

CONCLUSIONS.

From the data obtained from the curved track it is obvious that a truck which is constructed in such a way that it will remain square and hold the axles radially with the curve, will go around the curve with considerably less resistance than a track otherwise constructed.

From the tests conducted on the 600 ft. tangent track it would seem that where the wheels of the truck are not well mated, a method of construction which will hold the axle perpendicular to the track will tend to slightly reduce the resistance. The tests so far conducted have suggested several interesting things, which could not be developed owing to the lateness of the time in the fall, so it has been decided to continue the tests next summer, at which time it is hoped that sufficient data will be obtained to clearly demonstrate several interesting as well as important matters. To this end three additional pieces of experimental track are being constructed, having a curvature of 3, 6 and 12 deg. respectively. After tests are run on these three curves, there will then be available data as obtained from four different degrees of curvature, whereby a more satisfactory comparison can be made between the resistance of square trucks and loose trucks on different degrees of curvature.

THE COURSE OF RAILWAY SECURITY PRICES.

BY WILLIAM Z. RIPLEY.

Professor of Economics, Harvard University.

The fluctuations of railway security prices are like the waters of the sea; they move in tides, waves and ripples.* The great tidal sweeps, both for railway and industrial security prices, are mainly defined in recent years by the panic of 1893 and its ensuing four years of industrial depression. Both before and after this event quotations attained high-tide levels, although in different degrees. The first great tide began just after the panic of 1884—distinctly a railway disturbance—in a great upward sweep culminating just before the Baring collapse in 1890. After this brief interruption the upward swing continued until the sharp break of 1893. At this point low tide prevailed for about four years; but by 1898 it would appear that recovery had just about reestablished the general level of prices of 1885-92. From the latter part of 1898 dates that second and more remarkable general uplift which has now lasted for a number of years. This second great movement is of compelling economic interest, because, by reason of its magnitude, it is evidently far beyond the control of any speculative clique, however powerful. It represents a great tide whose causes are fundamental. But in order fully to understand these, the minor influences on the surface must be briefly treated by themselves.

The great tidal sweeps, judging by these diagrams, are over-

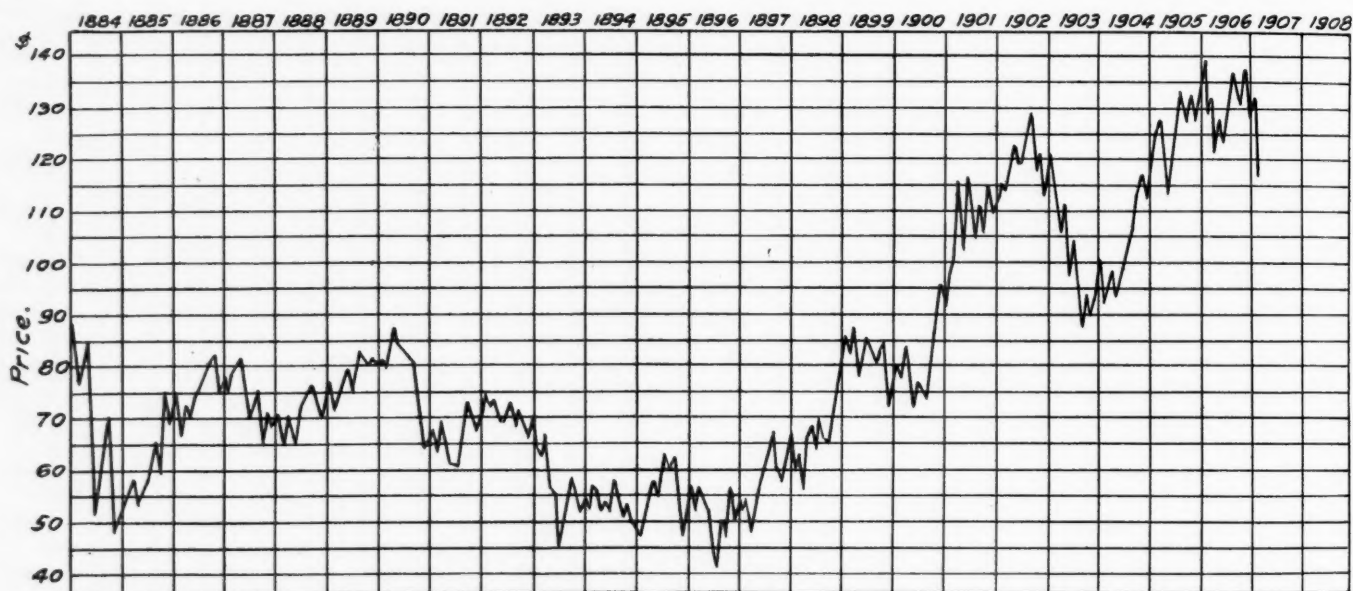
*The diagram covering the period since 1884 is from a bulletin of the Statistical Department of Thomas Gibson of New York. James Brookmire of St. Louis has also published an excellent chart of stock exchange movements for about the same period. The larger diagram is based upon an index number carefully compiled for many years by the Wall Street Journal. This index comprises 20 railroads and 12 industrial companies, the curves for each group being separately shown upon the chart.

laid by a series of secondary movements, some of them extending over several years. Among the earlier ones, 1886-7, 1890 and 1892 stand forth; while on the surface of the last great tide the years 1901-2 and 1905-6 appear as secondary waves. These are more clearly the result of artificial influences; but the part played by organized speculation, as distinct from either Nature, politics or the world's business affairs, begins to be discernible. This is evidenced by certain differences between the curves for railways and industrials.

The year 1898 set the speculative marionettes dancing; but its interest lay principally in the fields of industrial promotion. Unparalleled credit balances against Europe, and keen recollection of the dire results of unrestrained industrial competition during the preceding four years of hard times, brought about an extraordinary activity in the promotion of trusts. The railways were little involved. Their time did not come until two years later, when the second eruption of speculative mania occurred. The year 1901 was the time of great industrial underwriting syndicates, often utilizing the unwieldy surpluses of the New York life insurance companies. It was the year of the formation of the United States Steel Corporation. More to our purpose, however, is the fact that 1901 witnessed the spread of the consolidation movement over into the field of

way mergers of the preceding years about as the ill-considered International Mercantile Marine combination did to the flotation of the United States Steel Corporation. By this time credits had become over-expanded; and the inevitable penalty was paid in the panic of 1903. But the railways were relatively little involved in this disturbance except speculatively. The collapse was more notably among industrial corporations. They were all tried by fire, and a number of them, such as the ship-building, asphalt and bicycle companies, paid the price of reckless or dishonest promotion and management in bankruptcy and reorganization. The value of railway shares suffered considerably less in proportion than those of the trusts. The absolute fall of their index number was of course greater. Railway shares fell during 1903 by approximately one-fourth. But the index of industrial quotations dropped from about 67 to 42, or nearly 40 per cent. Moreover the benefits derived by the suppression of competition and of steadily advancing rates for transportation enabled the railways to recover more quickly whatever ground that they lost.

During the speculative wave of 1905-6 the tables were turned. This time the railways lagged behind the industrial companies. There was witnessed, to be sure, a culmination of quotations manifestly higher than in 1902 and prolonged over a greater



Fluctuations on New York Stock Market.

transportation. Great railway companies were bought and sold almost like eggs over the counter, the necessary funds being obtained by the issue of collateral trust bonds, secured by the deposit of the stocks thus purchased. The peculiar activity in railway consolidation, putting up market quotations unprecedentedly, is shown by the relatively great rise of the upper curve on the large diagram during 1900-1. The gap between railway and industrial index numbers, which formerly ranged from five to ten points, now becomes for several years 50 or more units. The widest separation between the two is in the late summer of 1902, when the index for industrials was about 67, while the peak of railway quotations carried them simultaneously almost to 130. The two indices stood for a season of ratios of almost one to two. A speculative pyramid was thus erected, finally embracing the general public on an unprecedented scale. On April 30, 1901, no less than 3,200,000 shares of industrial companies and railways exchanged hands. After a brief interruption, due to European interference based upon alarm at our financial excesses, the succeeding year 1902, was characterized by a renewal of speculation. But this time it fell into the hands of more reckless and financially irresponsible leaders. At this time the belated Rock Island plan was announced—chronologically related to the successful rail-

period of time. This could not be otherwise with the record of net earnings then being made, as will shortly be described. But the great campaign for the Federal and state regulation of common carriers was in full swing and operated to restrain an undue speculative enthusiasm. Whatever heights were attained by railway security prices were due to the phenomenal increase of business which the growth of the country had brought about. Prices could not well be "boosted" in the face of the political agitation then under way. Moreover the insistent pressure for funds for improvements and extensions, projected or actually under way, received little encouragement or satisfaction from a money market often drained of funds for purposes of speculation. No such positive legislative program concerned the "trusts." They likewise were prospering under their newly acquired earning powers. Their weaker members had been eliminated or been materially reorganized. So that in consequence the industrials, and mining and land promoters basked in a veritable sunshine of speculative favor. The railway financial sky, while moderately clear, was rendered hazy by the shadow of Congress. Matters thus went on for nearly two years, again with the inevitable result. Credit was overstrained, dishonesty developed, or rather was brought to light; and the panic year 1907 was the result. During this period, as the chart shows, the two

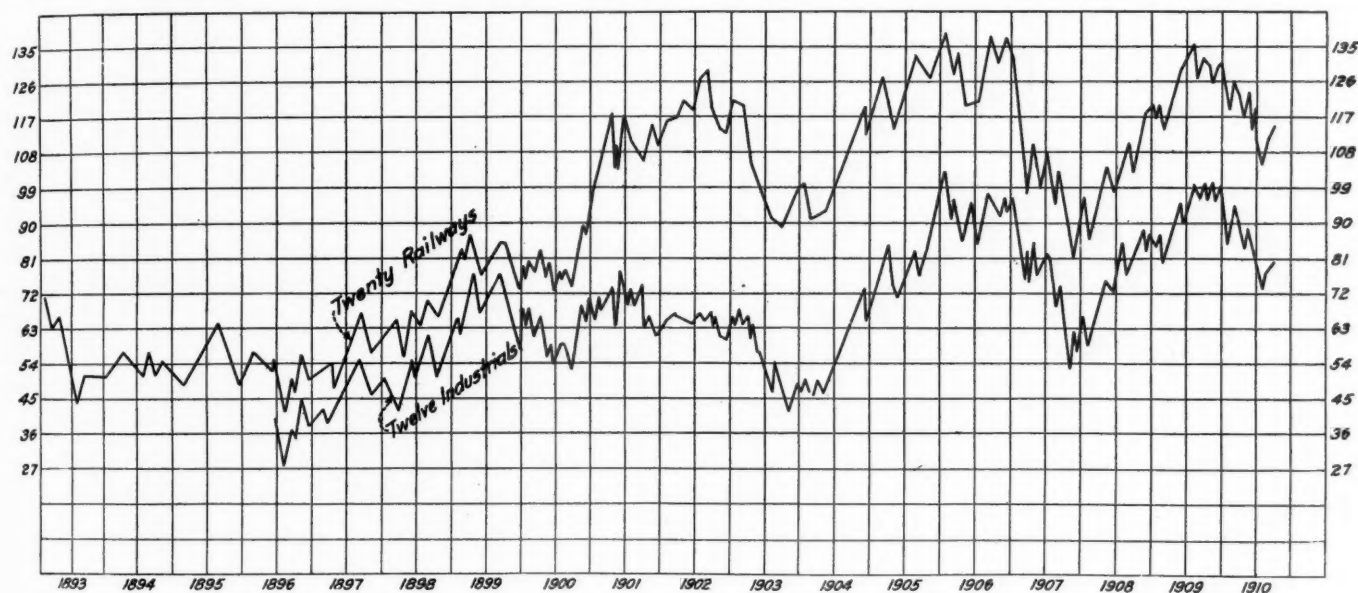
curves of index numbers were again becoming closer. The gap between them now narrows to about 30 or 40 points. So far as railways are concerned, recovery from this depression of 1907 was again retarded by a continuance of political agitation, finally leading up to the Federal act of 1910. And in the meantime the steadily increasing costs of operation, especially in so far as caused by widespread demand for higher wages, became more and more insistent. Despite these restraining influences, prices again rebounded after 1907, but scarcely attained the heights reached in 1905-6. On the other hand, they threatened in no wise to drop back to the levels of the preceding decade. Even the severe decline extending for over a year in 1909-10 does not bring the index numbers anywhere nearly as low as either in 1903 or 1907.

There yet remains for the briefest mention the speculative ripples upon the surface of the markets. These are for the most part seasonal, corresponding to the regular routine of crops, of the exigencies of banking and of general trade. Attentive consideration over a period of many years reveals what may be called a normal cycle. But the exceptions are so frequent that no confident prediction is ever possible.

Speculative campaigns "for the rise," so called, are usually favored by the periods of easy money in late winter and early

vailed? Momentous issues, such as the reasonableness of present capitalization, and the fairness of increased rates for service in future, hinge upon it for their determination. A negative answer is alone possible. Whereas the "waves" of prices in the eighties fluctuated above and below 70, according to the *Wall Street Journal* scale, and dropped in 1893-7 to a general level of about 50; they now seem to rise and fall about a standard as high as 110. In other words, the mean tide is upwards of 50 per cent. higher than it was before the panic of 1893. The general level of the years before the panic seem to have been about reached by 1900. But the results of growth up to that year merely afforded a new base upon which to construct an enormous advance, which has been in the main held ever since. Whatever fluctuations occur, and, as we shall see, they appear to be wider than ever before, none of them drops to any figure comparable with the price levels of the close of the last century. Nor is there the slightest doubt that conditions have become permanently established upon a higher financial plane as a result of the changes which have occurred since the year 1900.

On the other hand, the price chart bears evidence of a certain fixity or rigidity of financial status, particularly since 1903. There is great activity, with wide fluctuations above and below



Comparative Prices of Railway and Industrial Securities.

fall. June and January "rises" are traditional, but are of course, when they occur, the periods during which professional speculators expect to dispose of their holdings, accumulated during the preceding dull months of easy money. Not infrequently also, plans are laid for uplifted prices, based upon advance crop news in August or early September. Such an advance enables the professional manipulator to dispose of any stocks on hand. He then prepares to buy again at such lower prices as are apt to prevail during the crop moving period when "money is tight," public speculation lags, and Congress and the state legislatures convene. But all of these fluctuations have little to teach in a large way. The cycle is as apt to occur in the hollow of a great wave, as at its crest. Such matters must be of daily importance to the banking community or the stock broker, but have little significance for the student of transportation in any large way.

Turning now to the general conclusions to be drawn from consideration of this evidence, a most important large question is raised by the relative heights of the great tidal waves before and after 1893-7. Has the general level, the mean tide, of prices reached an elevation permanently higher than that of 1885-92? Or may the downward movement now under way in 1910 carry us back to conditions substantially like those which then pre-

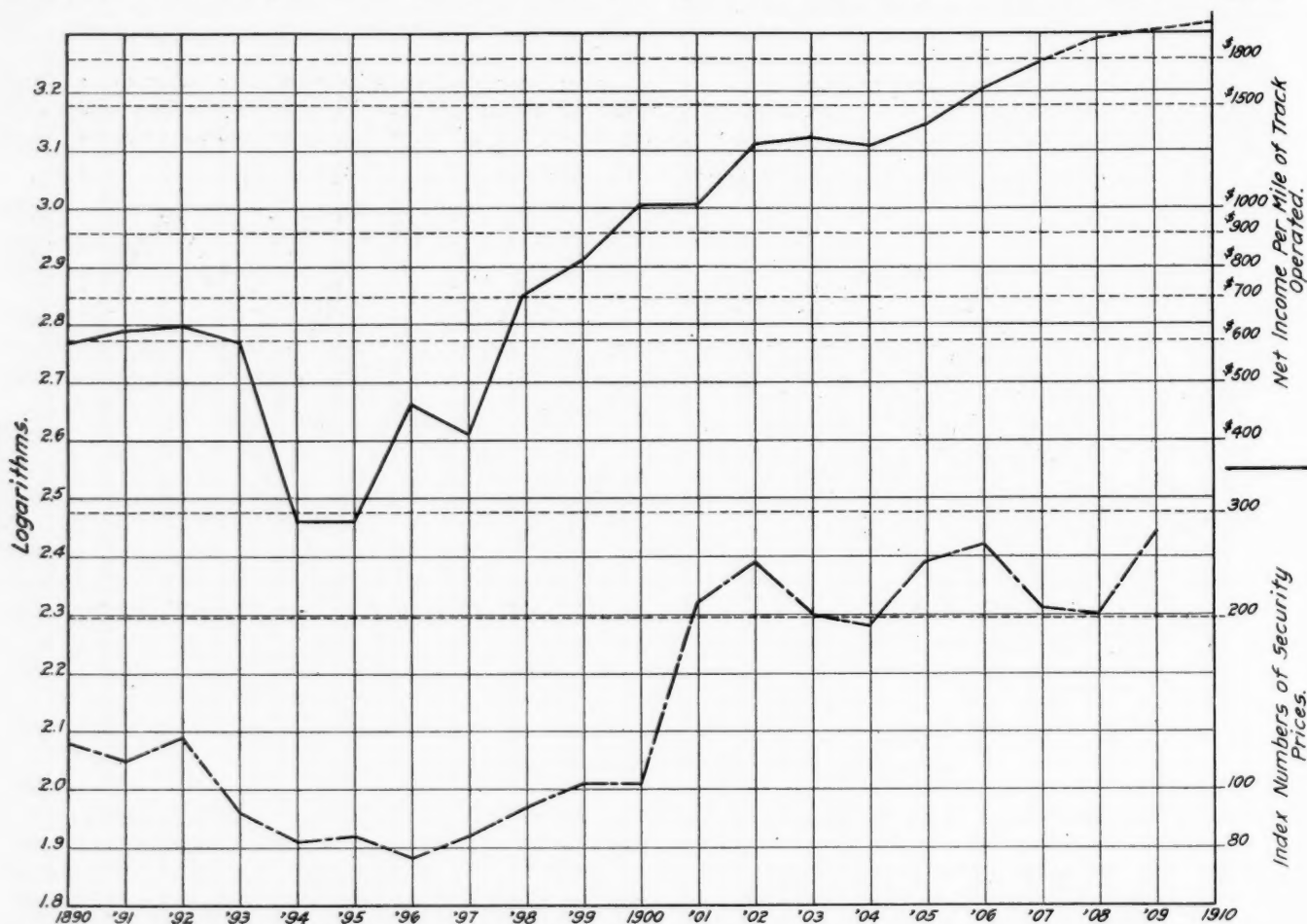
what appears to be a more or less horizontal line. But there is less evidence of up-grade in the general range during the last five years than for the first half of the decade. Prices seem somehow to have reached a sticking point. This is so important a matter that it merits examination with the utmost precision. Fortunately a very careful study of the prices of railroad securities, as compared with those of commodities in general, has recently appeared.* It has the advantage moreover, of being entirely independent of the *Wall Street Journal* index, already charted. Thirty-five railways and five express and allied companies, all affording continuous records since 1890, are comprehended in the series. Roads like the Burlington, Lake Shore, and even the Rock Island, are omitted because of change of financial status within the period. Moreover, the list excludes preferred shares in the main as being less sensitive to changes of sentiment or conditions. In this regard the index differs widely from our former series. In short this is really a more scientific selection than that of the *Wall Street Journal*. It is probably more reliable than any other evidence to be had. The index numbers for commodities are the well-known ones of the United States Bureau of Labor, slightly modified for purposes

*Professor W. C. Mitchell, of the University of California, in the *Journal of Political Economy*, XVIII, 1910, pp. 345-380.

of precision. For both securities and general prices, the average for the decade 1890-99 is taken as 100; and the arithmetical mean for each year is based thereon.

In addition to the valuable data of Mitchell as to market quotations, the course of net income of American railroads, as a whole, is essential to know. This is afforded by the official Statistics of Railways of the Interstate Commerce Commission. But instead of taking it by miles of line, it seemed best to reduce all income to a unit basis of trackage operated. Yards and sidings are excluded, but all the great improvements of double and even quadruple tracking of the last ten years are taken into account. And then, finally, in order to show with scientific precision the relative changes in each of the data compared, all the results have been plotted, not upon an absolute but a logarithmic scale. Such a scale, as is well known, indicates graphically by the slope of the curves the ratio of change in each case. It eliminates all differences of absolute magnitude. Everything is reduced to a

It is the course of events since 1902 which has the most significance. The net income year by year has gone on increasing; but, on the other hand, security prices seem to be fluctuating up and down about a horizontal rather than an ascending line. This would be even plainer were precise results for 1910 to be added; for the curve turns sharply down again, as it did in both 1903 and 1907. Both years of notable depression, in security prices, have only entailed slight halts in the upward course of income. This result in general may be shown in another way: Compare the reasonably comparable periods, 1890-2, and 1907-9, for example. Brief calculation for each of these three-year periods shows that in this interval of eighteen years, while market quotations for railroads have about doubled, the net income per mile of operated track has increased more than three-fold. Gross earnings per mile of line have during the same period only a little more than doubled. The surpassing rate of growth of income becomes even more striking if brought down



Logarithmic Chart Comparing Income and Prices of Securities.

matter of proportional change or rate of growth. The figures for interpretation as to absolute amounts are given on the right hand side of the chart. The lower half of the scale applies to the index numbers of price; those upon the upper half enable readings as to the net income per mile of track operated. But the really important features of the chart are not absolute amounts at all, but the relative slopes of the various curves for identical periods. Unless this point be firmly grasped, the real significance of logarithmic presentation is lost.

The first noticeable feature of this diagram is the rather close parallel between the movement of net income and prices of securities up to about 1902. Certain differences in individual years appear, as for 1896; but for the most part the two curves rise and fall together. They thus keep about the same distance apart. Between 1896 and 1902 growth of income seems to have anticipated stimulation of market prices; but the net result measured in percentage of growth is about the same for each.

to the latest date. While official data from Statistics of Railways for yearly periods are not yet available, a careful comparison by months covering the three years 1907-9 shows that operating income rose by about 20 per cent. The year 1910, so far as revealed, stands about 25 per cent. ahead of 1907—the last year included upon the chart. At this ratio, net income per mile of track operated in 1910 would be approximately three and one half times that in 1890-2, as compared with market prices enhanced at little more than half that rate. The latest indications for 1910-11 are for a distinct slackening of this rate of growth of net income.

This remarkable record of income is not due alone to an increase in the volume of business. Density of freight traffic has only about doubled within the same period. It is the character of the business which has perceptibly improved. In the early nineties the crops were all-important, and directly so. But there has been no increase in the volume of American agricultural

production commensurate with this augmentation of market prices and of net earnings. There was raised in 1890-2 about three billion bushels of cereals. The normal average production at the present time is scarcely 50 per cent. greater, not 100 or 200 per cent. One cannot therefore correlate the rise of income with the growth of our agricultural production. The statistical phenomenon which most closely corresponds in advance to that of railroad security prices and net income is the aggregate of bank clearings for the United States. These have gone on their upward way in much the same fashion evinced by railway financial phenomena. This is as it should be. For careful analysis of railroad traffic shows that it is steadily rising in grade. That is to say, mere raw agricultural products have become relatively less and less important and the general conditions of trade more and more so. It goes without saying, of course, that trade depends to a considerable degree upon crops; but the relation to railroad finance is considerably less immediate than it was a generation ago. Hence it should follow that bank clearings, taken as an index of trade conditions, ought normally to follow much the same onward course as the earnings of railroads; much more so than mere cereal production. It would be of great interest, were there available data, to compare the course of these two generally reliable criteria of trade activity, the earnings of railways and bank clearings, with a third one, the percentage of unemployed labor. This again often clearly reflects the state of business; but statistical practice in the United States is not yet sufficiently advanced to afford data, except in a few commonwealths like New York and Massachusetts.

There appear to be a number of distinct explanations for this relative retardation of security prices. It may be caused by an undue increase in capitalization as compared with earning power. It may be because of new and large entirely unproductive investments demanded by the public. It may be because of heavy capital obligations, ultimately productive but not yet utilized profitably to a large extent. It may be due to the competition of other forms of investment for the available surplus funds of the country. And, finally, it may be influenced by a change in the general rate of interest. Each of these factors seems to have played a part in encompassing the general result. And several of them seem to have acted quite independently of such other coincident influences, as the rise of commodity prices, increasing costs of operation or rising rates for service rendered. Two variables, market prices and revenue power, which, according to all economic laws, ought to move in unison, have somehow failed to do so. Positive explanations for so unusual a phenomenon are certainly needed as an aid to elucidation of the impending issue of government supervision of capitalization.

As for the first factor, above named, it is certain that many railroads have vastly increased their outstanding issues of stocks and bonds within the last decade. Some of them have surely allowed this enhancement of capitalization to outrun the growth of earnings. The New Haven road is a conspicuous example of financial expansion of this sort. But in all such cases the conclusion is entirely untenable that such expansion has enriched individual investors at the expense of the community. Often the result has been just the reverse. Market quotations of shares have progressively declined because of doubt as to the ability of the companies to continue their regular dividend policies. The fact is that within the period under consideration enormous increases in railway capital per mile of line have been made for purposes of improvement. Double and even four tracking, steel in place of wooden bridges, heavier rails and rolling stock, and especially much enlarged terminal facilities, have necessitated vast expenditures. Average capital invested per mile of line has greatly increased, although unfortunately we have no exact means of knowing how much. Such an increase requires far heavier net income per mile for its reasonable support. Had net earnings trebled, and had nominal capitalization also trebled during the same period, prices, instead of responding to the advance of revenue power, would have remained just as before. Such, in fact, or even worse is the condition of affairs in England. So grievously have they erred

in allowing their volume of security issues to expand, even faster than their increments of revenue, that prices of securities have actually declined in the face of a moderate expansion of traffic.

In the United States there is yet another feature of this increased capitalization which goes to explain in fact the relative inertness of quotations. Wherever such new capital has been obtained by extensive issues of shares at par or below the market price the effect, of course, is to reduce proportionately the market quotations. The value of "rights" comes off the price of the stock. On roads like the Great Northern or the Lackawanna such deductions for rights have been very great. Thus the relativity between income and quotations is disturbed in a twofold manner. It can scarcely be doubted that the relatively slow rise of our security prices tends to show that the enhancement of earning power has been appreciably outrun by the growth of capital obligations.

The second explanation offered is that large expenditures have been called for in recent years which are not in themselves directly productive of revenue. This is peculiarly true in the more densely settled districts east of the Mississippi and north of the Potomac and the Ohio rivers. Demands from the public have come thick and fast, both for better service and for safer service. The latter form of expense is, perhaps, financially, the more burdensome. Safety devices of all sorts, block and signal systems, air brakes and improved couplers for freight trains, are becoming the rule. And, as involving still larger outlay, the growth of population brings an irresistible demand for abolition of grade crossings, not only in large cities, but all along the right of way. Larger and better stations and terminal facilities are also demanded. Many of these improvements, although entirely proper, add nothing to the revenue capacity of the roads. Nor are they ever expected to add to it directly. Nevertheless the funded capital investment which they entail becomes a direct charge upon earnings and takes priority over the capital stock. It is inevitable that any growth in this form of expenditures must operate to retard the rise of quotations. The recent statement of President McCrea of the Pennsylvania in the freight rate hearings was highly significant. He reported an outlay of \$108,000,000 on the New York terminals, for a large part of which no additional return could reasonably be expected. Prestige and strategical position undoubtedly count for much; but, on the other hand, an improvement in public service for which the public in general may well congratulate itself follows as a matter of course. Yet such enormous outlay has directly affected the quotations for the shares.

Enormous outlays have been required in recent years, not only for public purposes quite unproductive of revenue, but also in order to lay a secure foundation for the traffic of future years. Such expenditure differs from the preceding sort in that while both may be for the moment unproductive, this latter class is intended ultimately to bring about a profitable use. Many companies, such as the Pennsylvania or the Chicago & North Western, have been forced by the growth of their traffic to make enormous actual investments of capital either from outside subscription or from reinvestment of surplus incomes, which capital has not as yet begun to yield a fair return. All over the United States a point seemed to have been reached a few years ago when the physical plant suddenly became outgrown.* Single track lines were swamped with traffic and terminals became congested beyond endurance. Great additions were made, in some cases sufficient to care for growth for many years ahead. Sometimes these additions were paid for by outside subscriptions of capital, sometimes by reinvestment of surplus earnings; but in either case the new increment of capital could not in the nature of things be utilized to its full capacity; that is to say made to yield immediately a normal rate of return in and of itself. The result was an apparent "watering" of capitalization. Only moderately increased revenues had to be distributed over a much wider capital base than before. Only gradually, as the growth of

*Fully discussed by the author in the *Railway Age Gazette* for September 4, 1908.

traffic "takes up the slack" of the new capital investment, will this apparent "watering" disappear. The present status of the Pennsylvania Company perfectly illustrates this point. Having now largely completed additions and improvements, adequate for the needs of years to come, its securities may with some confidence be expected to appreciate in value even more than commensurate with the growth of traffic or earnings from year to year. The present market price on its stock is not low because it has been unduly watered, but because it has to bear for a time a disproportionate burden of capital cost incurred to meet the need of future years.

The fourth factor, partially accountable for the laggard movement of market prices, is the competition of other forms of investment. There can be no doubt that the great and successful industrial combinations have heavily drawn upon the available supplies of capital for investment. And this tendency has been particularly potent since the panic of 1903. In this connection the divergences between the courses of the two index number curves in recent years, already commented upon, are significant. The closing up of the gap between the price indices of railways and industrials within the last five years has been due to the relatively greater rise for industrial securities. Their steadily expanding earnings, now that the weak ones have been eliminated; their immunity from price regulation by governmental authority, and the adoption of policies of financial publicity—all these influences have brought them into high favor. Moreover, the wonderful expansion of the world's copper consumption has necessitated great promotion of mining ventures. There is only about so much new capital available year by year for purposes of investment. And every share of the United States Steel Corporation, of American Tobacco or Sugar or of the Amalgamated Copper Company becomes a competitor with the securities of the railways. The potency of such competition cannot be doubted.

A factor finally to be reckoned with in comparing the general movement of prices is the possibility of a change in the general rate of return upon all capital investment. Any increase in the normal interest rate would necessarily bring down market quotations to a corresponding degree, even in the face of a constancy in the rate of net earning power. This intimate relation of the money market to prices was well exemplified in the fall of 1906 and the ensuing spring. Money was very "tight." First of all, this brought down the quotations for all classes of bonds; long-term securities were entirely unsalable at fair prices. The railways were compelled to issue notes as prices to yield nearly 6 per cent. This, in turn, induced the holders of stocks yielding less than this rate at going prices, to sell them down to an equilibrium. The drastic decline of the first quarter of 1907 was largely due to this cause. Imagine such a process, operating in either direction, to become chronic instead of acute, and permanent changes in price level must inevitably follow.

Taking into view all the complex factors set forth in the preceding paragraphs, one cannot entirely avoid the conclusion that one main reason for the retardation of market prices behind the advance of net market earnings has been a somewhat inordinate increase in merely nominal capitalization of our American railways. Almost every financial operation tending to an addition to capitalization; pure stock dividends following long continued reinvestment of surplus earnings in the property, or even offered without such warrant; additional subscriptions of new capital in order to increase facilities—nearly all of these operations offer in some form or another a bonus to stockholders or bond syndicates. There must be liberal "commissions" or stockholders' "rights" in order to encourage participation. And the result is that net earnings are to some degree distributed over a wider base than before. Were this not so, market prices of many roads—Lackawanna or Great Northern, for example—would unquestionably be far higher than they are to-day. Whether the new capital for expansion or improvement could have been obtained without such substantial encouragement must remain largely a matter of opinion. Similar "plums" by industrial combinations certainly tempt new capital away from railways. And such competition, of course, has to be counter-

acted in some way. On the other hand, for roads like the Pennsylvania, the gradual process of complete utilization of plant, built to accommodate years of growth ahead, will greatly lessen the apparent force of whatever indictment these comments may seem to imply. An entirely reasonable and proper explanation for the relatively retarded rise of market prices may be found within certain limits in the philosophy of railway finance herein contained.

Attention is drawn by the diagrams of security prices to yet another large issue. Can there be any question, after perusal of these charts, that the secondary waves of prices, as distinct from the great tidal sweeps, are more marked of late than they used to be? Are not the crests and hollows since 1898 much wider apart than they were prior to 1893? Shall we be content with the reply that inasmuch as the tidal depth is increased, the surface waves may properly be greater? A range of twenty units on our scale sufficed to define a "wave" in the earlier period. This was between one-third and one-quarter of the general elevation of the index number. Nowadays between crest and hollow forty units range is not unusual. This, to be sure, is still not far from one-third of the now substantially raised general level. But does that explanation suffice? One inevitably correlates this phenomenon with the great movements toward consolidation in operation, and concentration of control. This movement embraces, not railways and industrials alone; it comprehends within its sweep all manner of financial agencies. Banks and trust companies, especially in New York, are arrayed in great groups, with a resultant unprecedented power of domination. The great insurance companies, happily enough, have now been in a measure forced to stand somewhat apart. But all other agencies of importance in the game of organized speculation now co-operate to a common end as they never did before. And it is, of course, almost too well recognized to warrant mention that speculation creates or exaggerates; because it lives upon change, all of the normal fluctuations of prices determined from year to year by the weather, politics or fortuitous events.

Another matter, too technical to be fully treated at this time, but worth a passing comment, is the relation in time between changes of prices for railway securities and other commercial or industrial events. The stock market is very properly described as a barometer of trade conditions. It is its function to forecast the future. It is rarely concerned with happenings of the day, except they be sudden disaster. And, even then, it proceeds at once to consideration not of present status but of future effects. What then is the relation between the course of railway earnings and of the securities dependent upon them for returns? The answer may, of course, confidently follow that the security fluctuations regularly antedate the course of earnings. This is as it should be. It was well exemplified in the panic of 1903. Throughout most of that year security prices were crumbling away, and had actually begun to recover, according to our chart, before net earnings fell off. It was not in fact until January, 1904, that this occurred. Gross earnings might respond more quickly, owing to the ease with which expenditures may be postponed. But net earnings at this time were certainly very slow to respond to changes in general business. And much the same thing seems to have happened four years later, although the collapse was, if anything, more sudden.

But how about the course of railway earnings in relation to other commercial results of panic, such as changes in the volume of general business, the proportion of unemployment of labor, and more important still, the ups and downs of prices and of the costs of living? Is it indeed true, as has been confidently affirmed of Germany in 1900, "that the railroads are last to show the effects of depression and the first to recover? On the other hand, labor was the first to feel the depression and capital was the last to recover." If this be true of the United States as well, it has large importance for the owners of railway property. For it gives assurance of a stability of returns greater than that probable upon any other forms of investment. A most interesting and valuable vein of statistical research is uncovered extending over into fields hitherto not at all worked.

General News Section.

The Intercolonial—the government-operated railway of Canada—has made an increase of 10 per cent. in the wages of freight train men and of 20 per cent. in those of train men in the freight yards; all to take effect as of January 1 last.

The Highway Commission of the state of New York has opened bids for building 275 miles of wagon roads, and the contracts will soon be let. By these contracts nearly \$4,000,000 is to be taken from the state treasury for the benefit of certain towns of the state.

W. J. Jackson, vice-president and general manager of the Chicago & Eastern Illinois and the Evansville & Terre Haute, has been appointed chairman of the General Managers' Association of Chicago, succeeding R. H. Aiston, vice-president of the Chicago & North Western.

Luis Jackson, industrial commissioner of the Erie railroad, says that on one division of the Erie, where the tracks have recently been relocated, so as to reduce the ruling grades, the number of locomotives required to move the freight of the division is now 27 less than formerly.

On Monday last all trains in the Interborough Subway, New York City, were stopped and held motionless for two minutes, as a mark of respect to the memory of John B. McDonald, the head of the company that built the subway, whose funeral took place on that day. The ticket offices at the stations in the subway are draped in mourning.

The government has entered suit in the Federal Court at Pittsburgh, Pa., against the Pennsylvania and its western connections, to recover penalties for 33 violations of the law governing the transportation of cattle. It is charged that the time limit of 28 hours for the confinement of cattle in cars was exceeded by more than 10 hours.

On complaints alleging violations of sixteen-hour law for freight train crews, in 55 separate instances, the Indiana Railroad Commission has directed the attorney general of the state to file as many suits against the Pennsylvania lines for violation of the law on the Richmond division. A like action is now pending against the Cleveland, Cincinnati, Chicago & St. Louis.

Mrs. D. M. Tillotson, an operator in the office of the Western Union Telegraph Company at Chicago, has been retired on a pension after a service of 50 years. Mrs. Tillotson was born in New York state and was the first woman operator employed in the Chicago office. She has never used the typewriter, but in a test, eight years ago, she handled 60 messages an hour.

The legislature of the state of Washington has passed a bill for a full crew law. Besides requiring three brakemen on each freight train of 25 cars, it requires two brakemen on every passenger train of four cars or more and conductors on all engines running without trains. A press despatch of March 15 said that the governor had received a hundred telegrams asking him to veto the bill.

The legislature of Manitoba has sent a memorial to the Dominion Government at Ottawa asking that the Canadian railway law be so amended that railways may be compelled to put in telephones at all stations. Some of the farmers have complained that where there is no competition the railway companies refuse to install telephones, and that to the farmers this is a great inconvenience, especially in winter.

Charles R. Richards, chief of the college of engineering of the University of Nebraska, has been appointed professor of mechanical engineering, in charge of that department, at the University of Illinois, effective September 1, 1911. George A. Goodenough, who for many years has been associate professor of mechanical engineering at the University of Illinois, has been promoted to the grade of professor of thermodynamics.

The New York State Public Service Commission, Second district, calls attention to the fact that of the 9 persons killed and 307 injured in boiler accidents in the United States in the three months reported in the last government accident bulletin (bulletin No. 37), none of the deaths and only two of the in-

juries occurred in New York state, though New York has about one-seventh of the locomotives in the whole country. During the past year the number of boilers actually inspected by the two inspectors of the New York commission was 2,649; and they found 725 of these defective.

The general manager of the Lake Shore & Michigan Southern is quoted as saying that a number of retrenchment orders have been issued by this road and that probably some intended improvements will not be made. News items of this kind have been printed relating to affairs on the Chicago & Alton, the Illinois Central and the New York Central, but all of these items are brief and somewhat vague. The New York Central has dismissed considerable numbers of firemen; the Illinois Central has reduced office forces and the telegraph force and the Alton has laid off shop men at Bloomington.

The new railway law of California is already under discussion in the legislature for amendment, and the lower house has adopted almost unanimously a resolution looking to a constitutional amendment allowing the number of railway commissioners to be increased from three to five; the five to be appointed by the governor at large; but this proviso seems to be modified by a clause empowering the legislature to divide the state into districts. The increase in the number of members is a part of a movement to give the commission supervisory power over all public utilities. An Employers' Liability Bill, to apply to common carriers, has passed the lower house without opposition. This bill proposes to follow the federal law on the subject, doing away with the fellow-servant defense, etc.

The Indiana Railroad Commission announces that practically all of the interurban roads are observing the recent orders of the commission relative to discipline and other matters. The rule requiring a year's experience in the case of new motormen is being carried out without exception. The new law requiring a separate compartment for the motorman is being carried out as rapidly as the cars can be prepared. Only one company is disposed to question the necessity of such a rule. The expense to the companies in preparing separate compartments for motormen is from \$25 to \$75, according to the style of the car and kind of partition installed. The carrying out of the order of the commission to introduce the block system on interurban lines, now explicitly required by law, will be taken up by a committee with the commission on April 18.

When city or town authorities are too severe in the requirements which they impose on street railways, the New York State Public Service Commission (Second district), now and then takes a hand in behalf of the traveling public. In the village of Mamaroneck the trustees have been withholding their sanction to the construction of new turnouts (needed to facilitate the running of street cars more frequently), unless certain conditions, involving considerable expense to the company, shall be complied with; and the commission, having considered the situation has ordered the railway company, the New York & Stamford, to lay the turnouts before July 1, so that cars may be run at intervals of 10 minutes this coming summer; this frequency being held to be necessary to properly serve the public. The company is directed to secure municipal sanction; and what will happen if this sanction is refused remains to be seen.

The Ohio legislature has before it a bill to enlarge the powers of the state railroad commission. It is House Bill No. 325, introduced by Mr. Winters. It seeks to change the name of the commission to that of the Public Service Commission of Ohio. The bill was scheduled to be reported for action this week. The attitude of the shippers is non-committal, so long as the efficiency of the commission is not impaired, and at the meeting of the Ohio Shippers' Association in Columbus recently, this point was emphasized. The present commissioners are O. P. Gothlin, Oliver E. Hughes and J. L. Sullivan. Their tenure of office is six years, each governor having the appointing power of a representative thereon in each two year term. Commissioner E. E. Williamson of the Cincinnati Receivers' & Shippers' Association says: "We wish to recognize any and all good features of the proposed bill in so far as it operates for the public good, but we do not want to see the efficiency of our present commis-

sion undermined or weakened by having a load of additional work thrust upon it." The Joint Civic Committee of Cincinnati laid before the House Committee some criticisms. Under the new law the Cincinnati Traction Company would be exempt from supervision by the new Utilities Commission because a part of its lines are used for by an interurban railway. Also it was contended that the bill should provide for recording the true values of the corporations as nearly as could be determined, instead of the capital stock. Under the section which permits corporations to issue bonds for expenditures made within five years previous to the application of the law all the public service corporations of Ohio would be able to capitalize the money they have paid out in that period for wages. Wages not being an investment should not be capitalized. Another objection is that the law gives the commission no general grant of power to summon and compel the attendance of witnesses and to force them to testify.

Wages of Railway Machinists in Canada.

The wages of machinists in the railway shops of Canada average \$2.98 a day, the same as in the United States. This statement is printed for the purpose of correcting an error which appeared in an account of Canadian railways, which was published in the *Railway Age Gazette* of January 6 last. The error arose from a mistake in copying the number of days worked by machinists, in the report of one of the principal railways.

Safety Appliance Law Requirements.

The Interstate Commerce Commission has issued its formal order under the safety appliance act of April 14, 1910, extending the time to be allowed the railways to equip cars with uniform hand holds, hand brakes and other appliances required by the act. The commission adopts the recommendations made to it by the committee of railway officials and employees, namely, freight cars in service before July 1, 1911, to be equipped so as to conform to the law by July 1, 1916; passenger cars by July 1, 1914; road locomotives, July 1, 1913, and switching locomotives July 1, 1912.

The original order of the commission in this matter, issued last October, was noticed in the *Railway Age Gazette*, October 7, 14 and 21, and November 11. The law requires all cars to have sill-steps and efficient hand brakes; requires ladders and running-boards to be secure and suitable, and authorizes the commission to enforce uniformity in number, dimensions, location, etc. The order now issued contains the following exceptions in regard to freight train cars:

(a) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, or to change the end ladders on such cars, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.

(b) Carriers are granted an extension of five years from July 1, 1911, to change the location of brakes on all cars other than those designated in paragraph a to comply with the standards prescribed.

(c) Carriers are granted an extension of five years from July 1, 1911, to comply with the standards prescribed in respect of all brake specifications contained therein, other than those designated in paragraphs a and b, on cars of all classes.

(d) Carriers are not required to make changes to secure additional end-ladder clearance on cars that have ten or more inches end-ladder clearance, within 30 in. of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.

(e) Carriers are granted an extension of five years from July 1, 1911, to change cars having less than 10-in. end-ladder clearance, within 30 in. of side of car, to comply with the standards prescribed.

(f) Carriers are granted an extension of five years from July 1, 1911, to change and apply all other appliances on freight train cars to comply with the standards prescribed, except that when a car is shopped for work amounting to practically rebuilding body of car, it must then be equipped according to the standards prescribed in respect to handholds, running-boards, ladders, sill-steps and brake staffs: Provided, That the extension of time herein granted is not to be construed as relieving

carriers from complying with the provisions of Section 4 of the Act of March 2, 1893 [requiring hand-holds in ends and sides of all cars used in interstate commerce].

(g) Carriers are not required to change the location of hand-holds (except end-handholds under end-sills), ladders, sill-steps, brake wheels and brake staffs on freight train cars where the appliances are within 3 in. of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.

Buffalo, Rochester & Eastern Hearing.

The hearing before the New York Public Service Commission on the application of the Buffalo, Rochester & Eastern Company for authority to build a double-track railway from Buffalo to Troy was formally closed on Thursday. The attorney for the B. R. E. in summing up said:

"The control of the railway situation in this state by the New York Central is complete. It has its grip firmly fixed on everything, or nearly everything, in the neighborhood. Its ramifications are powerful and extensive. Six tracks and present facilities owned and controlled by the New York Central from Buffalo to the river should be the limit of their control, on broader ground, than the mere question of whether they are able to handle the transportation business naturally moving over such tracks or not.

"This case is a matter far reaching, bigger than delays, schedules, train service, estimates of tonnage and involves a fundamental consideration which strikes at the very root of the business prosperity of New York and New England and the territory served from the Niagara frontier and involves the prosperity of millions of people outside the territory directly served and the prosperity, comfort and happiness of hundreds of thousands of people in the territory directly to be served."

Electrification of Chicago Railways.

About a year and a half ago C. A. Seley, mechanical engineer of the Rock Island Lines, presented a paper on this subject before the Western Railway Club of Chicago. At a meeting of this club last Tuesday Mr. Seley presented another paper on the same subject, which was intended to cover the developments which had taken place since his first paper was prepared. He drew attention to the fact that the electrical engineers are not at all agreed as to the best method to be used for operating the roads electrically, and that there is at present no complete electrification of any railway or railway terminal comparable in size to the principal railways in Chicago. A considerable portion of his paper was devoted to the report of the Massachusetts Joint Board on Metropolitan Improvements, which was referred to in Mr. Seley's discussion of Paul P. Bird's paper on Locomotive Smoke in Chicago. Mr. Bird's paper was published in the *Railway Age Gazette* of February 17, page 321, and Mr. Seley's discussion of it appeared in the March 3 issue, page 385. A brief account of why the Massachusetts Joint Board decided against compelling the railways to electrify in and about Boston appears in another part of this issue in connection with the account of the electrical night of the New York Railroad Club. Mr. Seley also reproduced portions of the reports of officers of the New York, New Haven & Hartford and the Boston & Albany showing that the roads in the vicinity of Boston could not be electrified without greatly increasing the fixed charges and the operating expenses. Reference was also made to a paper by F. Darlington, chief engineer of the railway department of the Westinghouse Electric & Manufacturing Co., read before the Canadian Railway Club, in which it was shown that unless electrical power can be generated in very large plants and with a good load factor, the results will not be economical. The load factor in this case is defined as the ratio between the average load and the maximum or peak load. As the average load factor for principal plants generating power for railways is between 20 and 35 per cent., and as the fixed charges are necessarily based on the complete plant and the maximum output, it places a heavy burden on the actual production.

Chicago Electrification Studies.

A commission of railway officers, city officers, merchants and others has been appointed by the Chicago Association of Com-

merce to further investigate the electrification problem in that city; and this commission will appoint a chief engineer, who, with a staff of assistants, will make a systematic study of the engineering problems involved. The commission is made up largely of the same men appointed by the mayor a month ago to act as a railway terminal commission (see *Railway Age Gazette*, February 24, page 372). Among the railway officers on the commission are president Gardner of the Northwestern; president Miller of the Burlington, and vice-president Schaff of the New York Central. Dean Goss of the University of Illinois is also a member.

Chicago Track Elevation.

The officers of the city and the engineers of the railways have practically agreed on the plans for elevating about 15 miles of railway in Chicago during the next six years, most of the work to be completed in four years. The most important sections are the Illinois Central, Seventy-ninth street to Kensington avenue, five miles; New York, Chicago & St. Louis, Seventy-ninth street to Ninety-fifth street, two miles; Chicago, Rock Island & Pacific, South Chicago branch, two miles; and Chicago & Western Indiana, State street to Stoney Island avenue and on the Dolton branch, 3½ miles. Other sections are on the Belt railway, the Michigan Central and the Kensington & Eastern. The cost of the proposed work will be probably \$4,500,000.

"Accounting Series" No. Z9999X.

"Conductor Zerbe, of Lock Haven, running a passenger train on the Pennsylvania Railroad, last Thursday collected what proved to be the oldest ticket picked up in many years. At Milesburg a lady got on board and presented a ticket dated March 25, 1871. The ticket was in a splendid state of preservation."

The foregoing, from a local newspaper, is reprinted here for two reasons; first, to congratulate the lady on the fact that her ticket was not one of a "reorganized" company unable to honor its outlawed obligations and, second, to call the attention of Professor Adams to the necessity of issuing a ruling to cover such cases. Think of the money, rightfully belonging to the public, which has accumulated in the railway's treasury, during those long years, in the shape of interest on the value of that ticket! Who knows but what thousands of such tickets are outstanding? One thousand sold at a dollar apiece in 1871 would represent today a large sum of money in the company's treasury—from \$4,000 to \$10,000, according to the rate of interest permitted or authorized by the government statistician. Let us have no more fussing with shadowy questions about obsolescence and suspense accounts, when such clear-cut issues as this remain unsettled!

Howard Elliott on Railway Efficiency.

Howard Elliott, president of the Northern Pacific, has given out the following statement, commenting on the remarks of the Interstate Commerce Commission in its opinions in the rate advance cases on the subject of scientific management:

"Railways have always kept pace with other American business institutions (and it is to be hoped they always will) in adopting better methods and ideas, as fast as their merit and practicability have been clearly established. Railway managers, officers and employees are banded together in numberless organizations, formed solely to study railway business, formulate new ideas and encourage better efficiency. These, with the many journals devoted to technical matters of railway business, are an indication that officers and men alike want the newest and best ideas and are striving for efficiency.

"The work of these men, coupled with a broad policy on the part of the owners of railways to give the public the best possible service, has made the railway of today hardly recognizable as compared with the railway of twenty or even ten years ago, and has placed the efficiency of the American railway far ahead of the railway in any other country in the world. The business man can reach farther with his goods, enjoys better and more prompt service than he formerly dreamed of, and the public never enjoyed the use of better, faster or more luxurious trains, and at rates so low that students of the subject of transportation who come here from other countries are amazed.

"The railways are constantly working to give the public bet-

ter service and to make their methods of work more scientific, but if, in the face of rapidly growing expenses and diminishing net earnings, the public still insists on the increase of the already burdensome restrictions under which it has placed all of our railways, it will obviously have to do without what the railways would be glad to provide if they could. Railways must either earn or borrow money with which to meet the expense of improving old lines and the cost of new lines, and for furnishing better trains and better service. They are suffering, the same as do individuals, from the rising cost of living, yet they are paying a bill of \$20,000,000 a year imposed by the people through board and commission control, much of which is very doubtful value. It might be better for all business to give the railways a breathing spell, eliminate much of the useless and unnecessary restriction under which they work, and give them a chance to work out their problem of giving the public the service it wants by friendly discussion with that public, rather than to have constant friction and bickering."

Firemen's Strike on the Queen & Crescent.

The movement of freight appears to be improving, but press despatches give very little reliable information. Press despatches in the past appear to have been highly sensational, as an officer of the road informs us that there has not been anyone killed and not more than six persons have been injured. "Most of the shooting and intimidation referred to in press reports emanated from sources other than persons living along the line." This officer says that passenger trains have been run regularly except one short-trip local passenger train, and that some freight has been moved every day. Embargo notices were sent to connecting lines in order to enable the public to take advantage of other railways, where possible. The only time that negro firemen have been employed north of Oakdale was during the first few days of this strike (March 10-14). An officer of the company in a letter to the citizens of Lexington, said that the reports that employees and special agents had been killed were absolutely false. The company offered a reward of \$500 for the conviction of law breakers and applied to the governor of Kentucky for the appointment of 34 of its employees as special policemen. There is no serious accumulation of freight at any point on the line.

H. Baker, general manager, issued the following statement regarding the strike:

The white firemen left the service on March 9. The railway is divided into three operating districts. The third district is the one between Chattanooga, Tenn., and Oakdale, Tenn., a distance of 84 miles. In 1904, before the present management had charge of the road, it was not possible to secure enough white firemen to operate trains between Chattanooga and Oakdale, and because of this the company was forced to employ negroes as firemen and has had negroes in service constantly as firemen since 1904 on that part of the line. The agreement between the management and the firemen applies to all firemen. The committee representing the white firemen demanded that the company should, within 90 days, discharge from the position as firemen all colored men so employed and to agree that thereafter no negroes be employed as firemen. The company declined to grant this demand, and, thereupon, the committee representing the white firemen gave notice of their purpose to leave the service of the company. The committee gave this notice to take effect in less than 24 hours—in conflict with article 45 of the agreement dated July 1, 1910, which provides that 30 days' written notice shall be given of any purpose to revise or abrogate the agreement. The management immediately filed protest against this action, but, although an investigation was promised, no final answer has been given by the committee representing the firemen or by the officers of the firemen's organization. The Erdman Act provides for mediation between a railway and its employees, and at the last conference, on March 9, before the strike order took effect, the committee representing the firemen was urged to consent to mediation. This was declined, but, as the law provides that either party may make application to the mediators, a telegram was at once sent by the railway company to Judge Martin A. Knapp (appointed by President Taft as one of the Board of Mediation, Washington, D. C.), requesting him to immediately use his good offices with the firemen to bring about mediation. Although the management

of the railway has been always willing to accept the services of Judge Knapp as mediator, the officers of the firemen's organization and the committee representing the firemen have declined to accept his services.

The company has at all times faithfully carried out the provisions of the contract between the company and the firemen. Negroes are not employed as locomotive engineers, and the company will not employ negroes as engineers. Only white firemen are promoted to position of engineer. When the white firemen left the service of the company on March 9, on less than 24 hours' notice, it became necessary for the company to obtain such firemen as could be obtained to move the passenger and freight trains and meet the needs of the public. The company has always endeavored to give good service to its patrons and to meet in every way as a common carrier the needs of the public. It is recognized throughout the entire country as a high class railway, and the management will appreciate any assistance which can be rendered by the citizens in sections through which the railway runs in restoring the former satisfactory service. This statement of the situation is made so that all persons interested and the public generally may know the actual conditions.

Spokane Transportation Club.

The Spokane Transportation Club held its annual banquet and election of trustees on February 25, 1911. Covers were spread for 131 persons, every railway entering Spokane or doing business there being represented. Waldo G. Paine, vice-president and traffic manager of the Spokane & Inland Empire, acted as toastmaster. Among the speakers of the evening were J. B. Campbell, secretary of the Spokane Merchants' Association; Robert E. Strahorn, vice-president of the Oregon-Washington Railroad & Navigation Company, and H. G. Hawkins, of the Chicago Great Western. The following persons were elected as the executive committee: Waldo G. Paine, Spokane & Inland Empire; A. MacCorquodale, Oregon-Washington Railroad & Navigation Company; H. S. Collins, Chicago & North Western; E. C. Fleming, Great Northern; A. W. Doland, Spokane Drug Company. On March 2 the following officers were elected for 1911: Waldo G. Paine, president; A. W. Doland, first vice-president; H. S. Collins, second vice-president; J. W. MacIntosh, secretary; R. L. Ford, treasurer.

The Transportation Club of Detroit.

The officers of The Transportation Club of Detroit, Mich., are as follows: President, Walter G. Norvell, traffic manager, Parke, Davis & Co.; vice-president, L. M. White, commercial agent, Missouri Pacific; second vice-president, William Ferguson, traveling freight agent, Wabash; third vice-president, Frank E. Snow, agent, Lehigh Valley Despatch; secretary, W. R. Hurley, chief clerk, superintendent's office, Lake Shore & Michigan Southern; treasurer, Harry R. Ruse, ticket agent, Pere Marquette. The membership of the club is nearly 400.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

- AVR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; annual convention, May 23-26, Chicago.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting, June 22, 1911, Niagara Falls, N. Y.
- AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn., Sept. 19, 1911.
- AMERICAN ASSOCIATION OF LOCAL FREIGHT AGENTS.—R. O. Wells, East St. Louis, Mo.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
- AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 17, New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Oct. 17-19, 1911; St. Louis, Mo.
- AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION.—E. H. Fritch, Monadnock building, Chicago.
- AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 9, 1911, Detroit, Mich.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 14-16, 1911, Atlantic City, N. J.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wednesdays, except June and August, New York.
- AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York; 3d Tuesday of each month, New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York; next convention, May 30-June 2, Pittsburgh, Pa.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911, New Orleans, La.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911, Montreal, Can.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago; semi-annual, June 16-17, Washington, D. C.; annual, November 6-10, Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911, Boston, Mass.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Place, New York; June 20-21, 1911, Cape May City, N. J.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tuesday in month, except June, July and Aug., Montreal.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.
- CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; annual, October 9, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo, N. Y.
- CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug., St. Paul.
- ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.
- FREIGHT CLAIM ASSOCIATION.—Waren P. Taylor, Richmond, Va.; June 21, St. Paul, Minn.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—H. D. Judson, 209 East Adams St., Chicago; Wednesday preceding 3d Thursday, Chicago; annual, July 29, Chicago.
- INDIANAPOLIS RAILWAY AND MECHANICAL CLUB.—B. S. Downey, C. & H. & D., Indianapolis, Ind.
- INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.
- INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
- INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 15-18, 1911, Chattanooga, Tenn.
- INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.; next convention July 25-27, Chicago.
- INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.
- IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August, Des Moines.
- MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 19-21, 1911, Atlantic City, N. J.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION, OF UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.; Sept. 12-15, 1911, Atlantic City, N. J.
- NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.
- NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.
- NORTHERN RAILWAY CLUB.—C. L. Kennedy, C. & M. & St. P.; 4th Saturday, Richmond, Va.; 20th annual, June 21, 1911, St. Paul, Minn.
- OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Bldg.; second Wed.
- RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.
- RAILWAY CLUB OF PITTSBURGH.—C. W. Alleman, P. & L. E., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.
- RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.; June 13, New York; annual, Oct. 10, Colorado Springs, Colo.
- RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; annual, May 22-24, 1911, Milwaukee, Wis.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct., 1911, St. Louis.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis; annual, Oct. 20, Atlanta.
- SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Sept. 12-14, St. Paul, Minn.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.; semi-annual, April 20, Atlanta, Ga.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Prudential bldg., Atlanta, Ga.; 3d Thurs., Jan., April, August and Nov., Atlanta.
- TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday; annual, May 6, 1911, Toledo.
- TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.
- TRAFFIC CLUB OF PITTSBURGH.—T. J. Walters, Oliver building, Pittsburgh, Pa.; meetings monthly, Pittsburgh.
- TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911, Baltimore, Md.
- TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 11, 1911.
- TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; annual, August, 1911, Chicago.
- WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August; annual, May 8, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.
- WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Wednesday in month except July and August, Chicago.
- WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, First National Bank bldg., Chicago.

Traffic News.

The census bureau has gathered statistics of the cotton crop for the past year and reports that, including linters, there will be over 12,000,000 bales. This is 500,000 bales more than the number estimated by the Agricultural Department last December.

In the first seven weeks of this year the station agents of the Southern Railway in Georgia reported the receipt of about 40 per cent. more commercial fertilizers than in the same period of 1910—35,712 tons this year and 25,607 tons last year. It is believed that this increase is due, not so much to an increase in acreage, as to the determination of the farmers to secure larger crops on each acre.

A man has complained to the Pennsylvania State Railroad Commission, because he could not get, for 25 cents, a seat in a sleeping car for a ride of about 50 miles, in the middle of the night. The Pullman conductor informed him that after 11 p. m. the charge would be the same as for a berth all night, \$1.50. The Pullman Company holds that the ordinary hour for retiring should be 10:30 p. m., and, in its answer, so advised the commission.

The Interstate Commerce Commission has denied the request of western railways for a further hearing regarding the question of the readjustment of passenger rates under the fourth section of the Interstate Commerce act. The roads had appointed a committee composed of Gerrit Fort, passenger traffic manager of the Union Pacific; John Francis, general passenger agent of the Chicago, Burlington & Quincy; W. J. Cannon, assistant general passenger agent of the Chicago, Milwaukee & St. Paul, and B. H. Payne, general passenger agent of the Missouri Pacific, to present their case to the commission, but Commissioner Prouty notified the committee that the commission had finally decided to require the roads to conform strictly to the provisions of the fourth section and that they must get their tariffs revised by April 1, so that they will show the specific fares, and by July 1 must make all their tariffs conform to the long and short haul clause, except in cases covered by specific applications.

Traffic Club of New York.

The Traffic Club of New York will hold a meeting at the Waldorf-Astoria, Tuesday March 28, at 8 p. m. Alvin Hunsicker, general manager of the Standard Oilcloth Company, will speak on "Our Business and Our Relations to the Public and Carrier."

Traffic Club of Chicago.

William Ellis, commerce counsel of the Chicago, Milwaukee & St. Paul, was a speaker at the monthly luncheon of the Traffic Club of Chicago on March 14. Mr. Ellis's subject was Government Regulation. He said that regulation itself is so firmly established that the question of whether there ought or ought not to be regulation is beyond discussion. Continuing Mr. Ellis said in part:

"Today the different states by means of their commissions regulate part of the service, part of the rates and part of the operation of railways. The commerce commission regulates part of the service, part of the rates and part of the operation, and the several legislatures regulate part of the rates, service and operation. Out of all this mass of diverse regulation comes a conflict of interest costly to the railways and necessarily reflected in additional burden on the public.

"The real reason underlying this difficulty is that no practical railway man serves on any railway commission and no practical railway man could be elected to any legislature, so that these questions requiring for solution knowledge which can come only with experience, are decided by those who lack such experience. The remedy would seem to be in strengthening the power of the commissions and in enlarging their fields. There could be appointed to these bodies a minority of practical railway men, including both expert traffic men and expert operating officials. I would have the legislatures pass no laws whatever affecting the railways, and when in their judgments additional regulations are necessary they should proceed by resolution setting forth what they think should be done, to be referred to the commission

with direction to investigate and, with proper delegation of power, to act.

"It would seem that such regulation as this would result in broader and more technically intelligent action. There probably would be little difficulty in finding for both state and federal positions railway officials to whom such service in the interest of both carriers and public—for their interest is a common one—would be a fitting conclusion to a career of railway service."

INTERSTATE COMMERCE COMMISSION.

The commission on March 20, issued a circular outlining its proposed course in regard to telegraph and telephone companies, which by the law of last June are included in the term "common carrier," and made subject to the Interstate Commerce Law, as a regulation of interstate business. The commission holds that each and every telegraph and telephone company transmitting interstate messages is subject to the act; but that if an intrastate company transmits an interstate message to another company, it is not subject to the provisions of the act unless there be an arrangement between the two companies for through continuous transmission. If two or more lines connect and are used for an interstate conversation the transmission of that conversation is interstate commerce; companies thus participating must conform to the provisions of sections 1, 3, 15 and 20, requiring that charges shall be reasonable and just, limiting free service, forbidding undue preference and regulating the keeping of accounts and memoranda. The commission withholds its views regarding other questions.

Fares on Electric Line Reduced.

Beall v. Washington A. & M. V. Opinion by the commission: Single passenger fare of 15 cents, Washington, D. C., to Mount Ida and other points in Virginia, about 5 miles, found unreasonable and ordered reduced to 10 cents. (20 I. C. C. 406.)

Long and Short Haul Rules.

The commission has issued a circular regarding the questions arising under the fourth section of the act to regulate commerce as amended June 18, 1910, ordering in substance, as follows:

"1. The fourth section applies to all rates and fares, but in determining whether its provisions are contravened rates and fares of the same kind should be compared with one another, that is proportional rates should be compared with proportional rates; excursion fares with excursion fares, etc. It would not be in violation of the fourth section, for instance, if the commutation fare to or from a more distant point were lower than the regular fare to or from an intermediate point.

"A proportional rate is one which applies to part of a through transportation which is entirely within the jurisdiction of the act to regulate commerce; that is, the balance of the transportation to which the proportional rate applies must be under a rate filed with the commission. A rate to a port for shipment beyond by a water carrier not subject to the provisions of this act would not be a proportional rate.

"An excursion rate is one which provides for a return to the initial point or some corresponding point.

"2. . . . Owing to the very general practice of absorbing switching charges from competitive and not from non-competitive stations, and in view of the fact that much benefit and little complaint results, the commission will, by general order, permit a continuance of this practice, reserving for consideration and determination individual cases which may require special consideration.

"3. If a carrier has been given authority to maintain from or to non-competitive intermediate points rates higher than those from or to more distant competitive points and a new intermediate station is opened, rates from or to such intermediate station which are in harmony with those authorized may be established without special authority.

"4. If a carrier is authorized to maintain rates to or from a given point which are not in conformity with the fourth section it may establish rates upon branch lines connecting with the main line at these points which are higher than such intermediate rates by arbitraries or by the branch line locals, without special authority from the commission."

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JANUARY, 1911. (SEE ALSO ISSUE MARCH 17.)

Name of road	Mileage operated at end of period.	Operating revenues			Way and maintenance		Operating expenses			Net operating revenue (or deficit).	Outside operations, net.	Operating income (or loss).	Increase (or dec.) comp. with last year.
		Freight	Passenger	Total, inc. misc. structures.	Of equipment.	Traffic.	Trans- portation.	General.	Total.				
Buffalo, Rochester & Pittsburgh.....	579	\$615,472	\$75,138	\$707,659	\$53,838	\$145,442	\$10,066	\$12,982	\$478,343	\$229,316	\$139	\$16,000	\$213,455
Central of Georgia.....	1,915	726,141	275,971	1,002,112	143,420	182,975	30,579	36,563	786,464	319,007	5,804	46,081	45,361
Chicago & Alton.....	1,025*	731,539	323,924	1,055,463	102,759	246,952	479,110	34,491	900,364	244,140	-1,198	270,930	40,774
Chicago & Eastern Illinois.....	966	815,993	174,430	1,059,760	84,784	179,821	22,731	35,475	754,200	305,560	-747	28,500	41,501
Chicago & Northwestern.....	7,744†	3,550,178	1,370,357	5,436,588	449,635	811,571	11,656	138,030	4,231,306	1,185,283	-4,134	260,000	660,946
Chicago, Burlington & Quincy.....	9,091‡	4,334,342	1,629,922	6,621,904	521,542	1,277,095	132,903	196,803	4,615,669	2,006,235	-10,334	250,454	76,315
Chicago, Great Western.....	1,496	672,035	201,627	873,662	101,928	162,127	46,427	34,714	805,583	32,823	714	111,832	53,275
Chicago, St. Paul, Minneapolis & Omaha.....	1,741	826,040	324,495	1,250,535	121,883	165,170	21,681	32,699	1,349,349	357,416	-1,484	60,180	41,607
Cincinnati & Dayton.....	1,013§	575,067	113,658	688,725	75,617	147,649	23,062	21,385	651,437	105,080	72,776	32,303	15,927
Colorado & Southern.....	1,181¶	623,449	99,113	722,562	64,132	145,877	12,740	25,554	506,923	259,804	-2,391	24,700	35,754
El Paso & Southwestern Co.....	901¶	530,492	81,075	611,567	74,620	82,786	10,694	22,395	247,839	247,839	-853	20,074	226,912
Elgin, Joliet & Eastern.....	832b	510,011	3	510,014	546,763	49,415	3,710	13,465	418,140	128,223	.....	15,400	32,948
Gastonia, Harrisburg & San Antonio.....	1,338	596,462	246,108	842,570	890,717	112,715	370,413	28,738	701,492	189,225	-1,630	29,697	157,898
Gulf, Colorado & Santa Fe.....	1,518	697,533	238,487	936,020	1,004,012	216,732	24,536	33,482	929,848	74,164	.....	33,307	40,857
Houston & Texas Central.....	789	336,843	131,940	468,783	91,783	69,329	18,545	24,140	448,159	57,502	-1,275	17,842	12,752
International & Great Northern.....	1,160	511,986	168,196	680,182	732,765	125,051	21,929	21,816	637,013	95,752	-416	23,000	73,336
Iowa Central.....	859	244,897	38,596	283,493	297,608	28,633	7,924	142,110	234,822	62,786	.....	9,876	28,118
Kansas City Southern.....	527	603,576	134,784	738,360	823,136	78,295	306,105	35,973	565,004	258,132	.....	26,384	231,748
Lake Erie & Western.....	886	363,826	63,978	427,804	69,165	86,117	11,563	12,462	376,834	73,725	.....	18,000	55,725
Maine Central.....	932	464,411	163,630	628,041	74,730	119,925	5,835	26,046	527,162	144,854	-1,267	38,280	24,701
Minneapolis & St. Louis.....	1,027	293,926	78,679	402,604	32,809	59,975	182,709	21,320	308,408	93,596	-12	18,748	49,840
Missouri, Kansas & Texas.....	1,737	915,998	402,972	1,409,057	158,133	133,128	39,210	51,212	891,879	517,178	-1,313	58,548	457,317
Missouri, Kansas & Texas of Texas.....	1,348	497,410	290,426	787,836	409,434	70,276	22,785	38,980	715,849	17,500	-2,972	25,500	108,117
Mobile & Ohio.....	1,114	667,528	124,931	792,459	106,497	174,341	31,677	34,281	672,417	261,464	833	25,460	3,999
Nashville, Chattanooga & St. Louis.....	1,230	811,854	237,673	1,049,527	158,162	121,555	34,359	32,555	836,020	291,791	-1,730	28,287	657
New York, Chicago & St. Louis.....	561	759,169	99,651	858,820	92,501	117,350	48,802	17,343	712,632	178,377	-1,851	29,600	146,926
New York, Ontario & Western.....	546	583,329	73,662	656,991	73,349	131,535	34,069	17,840	567,481	114,360	-5,572	17,500	91,288
Oregon Short Line.....	1,646c	962,994	307,405	1,270,399	123,210	198,384	38,739	41,807	779,586	607,441	4,477	69,075	533,889
Oregon-Washington R. R. & Nav. Co.....	1,636¶	756,815	343,485	1,100,300	139,504	129,507	38,836	46,410	848,585	321,696	-6,719	63,535	321,442
Pere Marquette.....	2,334	836,262	262,731	1,098,993	164,927	230,264	67,544	35,495	1,144,186	52,564	-11,445	57,331	-165,796
Philadelphia & Reading.....	1,024	294,538	542,604	837,142	232,090	665,976	47,755	126,670	68,866	2,284,357	-26,977	83,961	1,236,742
San Antonio & Aransas Pass.....	1,722	209,460	86,323	295,783	86,667	137,163	15,915	11,453	312,172	4,583	.....	11,000	190,759
San Pedro, Los Angeles & Salt Lake.....	1,105d	398,379	208,628	607,007	647,421	135,500	34,049	19,540	561,051	86,370	19,540	283,634	138,937
Southern Pacific Co.....	6,187e	3,643,360	2,977,786	6,621,146	860,244	962,892	179,473	21,393	4,371,990	2,167,093	-45,177	1,836,262	406,934
Texas & Pacific.....	1,885	583,901	323,081	906,982	134,445	246,155	18,074	622,604	1,059,337	263,336	-818	38,674	223,634
Vandalia.....	827	547,727	181,960	729,687	79,352	170,528	28,605	21,619	671,182	153,341	.....	26,700	126,641
SEVEN MONTHS OF FISCAL YEAR 1911.													
Buffalo, Rochester & Pittsburgh.....	572	\$4,760,966	\$668,736	\$5,429,702	\$567,526	\$1,031,622	\$80,582	\$92,738	\$3,546,208	\$2,098,601	\$664	\$112,000	\$1,987,355
Central of Georgia.....	1,915	5,035,362	2,155,317	7,190,679	1,072,359	1,252,154	228,489	292,068	5,297,127	2,572,128	46,444	323,943	2,294,659
Chicago & Alton.....	1,025*	5,894,668	2,665,226	8,559,894	1,236,999	1,414,895	266,247	243,169	6,570,277	2,369,537	-13,515	210,422	67,725
Chicago & Eastern Illinois.....	966	5,757,739	1,297,329	7,055,068	737,379	1,349,714	167,513	231,700	5,241,748	2,407,961	-9,647	195,629	2,102,685
Chicago & Northwestern.....	7,744†	30,099,225	11,916,517	42,015,742	6,376,686	5,504,209	187,247	955,050	32,318,647	13,697,749	-10,591	1,880,000	11,807,158
Chicago, Burlington & Quincy.....	9,091‡	36,096,868	14,298,358	50,395,226	54,883,164	8,800,065	757,042	1,294,476	35,768,784	19,114,380	-52,564	1,753,212	3,296,760
Chicago Great Western.....	1,496	5,207,849	1,763,968	6,971,817	845,990	1,117,679	329,067	249,150	5,535,770	1,998,455	2,419	229,758	1,771,116
Chicago, St. Paul, Minneapolis & Omaha.....	1,744	6,619,709	2,857,757	9,477,466	1,153,031	1,811,759	167,263	204,317	6,474,151	3,646,414	-8,106	412,515	3,225,793
Cincinnati, Hamilton & Dayton.....	1,015§	4,115,884	1,059,441	5,175,325	434,307	993,364	170,671	153,085	4,371,914	1,389,489	.....	117,848	61,618
Colorado & Southern.....	1,181¶	4,636,158	1,015,914	5,652,072	698,741	1,129,360	82,940	155,337	3,923,902	2,030,383	-9,654	172,900	55,032
El Paso & Southwestern Co.....	901¶	3,517,489	566,957	4,084,446	429,137	570,057	120,139	158,795	2,561,735	1,729,602	-8,597	129,175	58,813
Elgin, Joliet & Eastern.....	832b	4,516,467	51	4,516,518	497,734	991,795	28,425	124,415	3,321,604	1,494,940	.....	107,800	387,140
Gastonia, Harrisburg & San Antonio.....	1,338	4,688,019	1,613,648	6,301,667	800,306	1,013,008	187,336	197,461	4,645,440	1,985,680	-19,867	210,746	620,573
Gulf, Colorado & Santa Fe.....	1,518	5,364,529	1,957,542	7,322,081	780,508	1,320,531	171,720	222,922	5,735,151	2,081,357	.....	230,345	34,124
Houston & Texas Central.....	789	2,777,700	1,044,269	3,821,969	533,884	468,905	128,163	150,427	2,818,368	1,251,574	-1,857	129,476	11,042
International & Great Northern.....	1,160	4,099,321	1,302,938	5,402,259	817,535	1,037,691	138,340	150,527	4,205,922	1,552,599	-2,587	152,000	366,839
Iowa Central.....	559	1,660,975	344,729	2,005,704	248,434	363,249	49,972	61,676	1,587,121	510,994	.....	68,616	442,378
Kansas City Southern.....	827	4,509,132	1,013,016	5,522,148	613,744	619,795	182,044	208,611	3,850,274	2,284,470	.....	131,242	392,067
Lake Erie & Western.....	886	2,633,823	577,857	3,211,680	339,054	545,285	112,402	85,716	2,653,844	739,210	.....	131,762	607,448
Main Central.....	932	3,153,881	1,907,158	5,061,039	539,137	904,397	204,885	181,426	3,928,062	1,471,075	15,309	328,887	369,440
Minneapolis & St. Louis.....	1,027	2,044,814	771,231	2,816,045	345,597	401,212	77,587	108,966	2,172,834	1,009,093	-240	141,724	867,129
Missouri, Kansas & Texas.....	1,737	7,026,060	2,446,466	9,472,5									

COURT NEWS.

The decision of the Supreme Court of the United States in the suit against the Atchison, Topeka & Santa Fe, in relation to the working hours of telegraphers, is noticed on the editorial page.

In the Federal Court at Philadelphia last week, a fine of \$1,000 and costs was imposed on a passenger who had ridden from New Brunswick, N. J., to Philadelphia, Pa., over the Pennsylvania railroad on a ticket which bore the name of another person. Subsequently the fine was reduced by the court to \$100, in response to a plea for leniency.

The United States Supreme Court, in a decision by Justice Lamar, has decided the suit of the government against the Baltimore & Ohio Southwestern concerning the law forbidding the confinement of animals in cars more than 28 hours. The government contended that the number of offences for which a carrier should be punished should be measured by the number of shipments, while the railway contended that each train load should be considered as a unit, regardless of the number of shipments; in other words that there should be but one penalty for a whole train. The court accepts neither view. Justice Lamar says:

Penalties are to be fixed by reference to the times of loading and unloading. He held the road liable to nine penalties, because nine times it failed to unload live stock carried in a train more than the 28-hour period. The Government claimed eleven penalties because there were eleven shippers. The railway was willing to pay one penalty, all the stock having been carried in one train. A year ago the court was divided four to four and so affirmed a decision of the Ohio Federal Court that the shipment of the separate consignor should be the unit. The present decision is unanimous.

In the United States District Court at Savannah, Ga., March 17, the Atlantic Coast Line and the Seaboard Air Line each pleaded guilty to violation of the law in the transportation of grain from Philadelphia, Pa., to Jacksonville, Fla., and were fined \$2,000 each; the decision being by Judge Emory Speer. The grain was carried at 10 cents per 100 lbs., when the tariff called for a rate of 15 cents. The Merchants & Miners' Transportation Company (a water line) had been convicted of the same offense, on 24 counts, and as a result of this decision the railways named pleaded guilty on one count of each indictment against them. The government's attorney decided, in view of this action of the railways, not to prosecute the other six counts, which he had presented against each company.

The United States Circuit Court of Appeals, third circuit, in a decision prepared by Judge Buffington, has confirmed the action of the lower court in the Sand Patch air-brake case. The lower court, after hearing the case for a week and examining a large number of witnesses, threw the suit out of court; and Judge Buffington confirms this action because the record is so mixed that it is impossible to tell just what the evidence was. The suit was that of the Government to impose penalties on the Baltimore & Ohio for violating the safety appliance law in using hand-brakes to control the speed of freight trains descending the steep Sand Patch grade, in Pennsylvania. The gist of the opinion of the lower court was that the law did not prohibit the use of hand-brakes, as an additional precaution, if the railway company had a sufficient number of cars in each train with the air-brake apparatus connected to the engine so that by means of the air brakes the engineman could control the train, within the meaning of the law. Judge Buffington says:

"Each of the judges of this court separately and all of them jointly have examined and discussed the voluminous testimony, and owing to the way in which it was taken we are unable to intelligently apply it to the cars mentioned in the numerous counts. Nor are we aided in that respect by the briefs in a specific reference to testimony applicable to particular cars or particular counts. Under such conditions we are unable to determine whether there was or was not evidence to go to the jury on particular counts, or indeed, to ascertain with certainty the actual facts involved and thus have an assured basis with reference to which the statute could be construed. In the absence, therefore, of any satisfactory showing that the Court below committed error in withdrawing the case from the jury

and without expressing any opinion as to the construction placed by it on the statutes, we affirm its action in refusing to take off the non-suit."

Commission Reversed on Willamette Valley Lumber Rate.

The last of the decisions handed down by the Supreme Court of the United States on February 20, was that in the case of the Southern Pacific against the Interstate Commerce Commission to secure the annulment of the commission's order reducing rates on rough lumber from points in Oregon, south of Portland, to San Francisco. The decision, by Chief Justice White, is in favor of the railway company.

To make a market for the lumber of the Willamette Valley, the Southern Pacific about 1898 established a rate of \$3.10 a ton to San Francisco. In 1907, concluding that the lumber interests had become prosperous, the rate was advanced to \$5, the road declaring that the former rate was unreasonably low. Moreover, the shippers by this time had found an eastern market by way of Portland. The shippers complained to the Interstate Commerce Commission, and the commission ordered the \$5 rate reduced to \$3.40. Some of the towns embraced in the order were within a few miles of Portland, but Portland was not given the benefit of the reduction; the commission holding that Portland enjoyed the benefit of water competition, and therefore did not need the reduction. The road defended its \$5 rate not only on the ground that \$3.10 was abnormally low, but also because of a great increase in the cost of the operation of the road since 1898. Even if the \$3.10 rate were to be found reasonable on an ordinary railway, it was unreasonably low here because of the mountainous country traversed, making the cost of train running much greater than the average. The circuit court, to which the commission's order was appealed, decided against the railway, holding that as the commission had found that a rate of \$3.40 gave some remuneration above the cost of operation, there was no power to interfere.

Before the supreme court, the railway company admitted that where the commission finds a rate in and of itself unreasonable, its order making a reduction, should not be subject to be reviewed by the court; but it was argued that the order of the commission was in excess of the power conferred upon it by law. The question, therefore, is: What was the nature and character of the order made by the commission? Answering this, Chief Justice White says:

"The contention is, that although the order made by the commission may have been couched in a form which would cause it, superficially considered, to appear to be but the exercise of an authority to correct an unreasonable rate, yet if it plainly results from the record that the order of the commission was not the exercise of such an authority, but was based upon the assumption by that body of the possession of a power not conferred by law, the mere form given by the commission to its action does not relieve the courts from the duty of reviewing and correcting an abuse of power. Applying these propositions, the insistence is that both in form and in substance the order of the commission is void because it manifests that that body did not merely exert the power conferred by law to correct an unjust and unreasonable rate, but that it made the order which is complained of upon the theory that the power was possessed to set aside a just and reasonable rate lawfully fixed by a railway whenever the commission deemed it would be equitable to shippers in a particular district to put in force a reduced rate. That is to say, the contention is that the order entered by the commission shows on its face that that body assumed that it had power not merely to prevent the charging of unjust and unreasonable rates, but also to regulate and control the general policy of the owners of railways as to fixing rates, and consequently that there was authority to substitute for a just and reasonable rate one which in and of itself in a legal sense might be unjust and unreasonable, if the commission was satisfied that it was a wise policy to do so or because a railway had so conducted itself as to be estopped in the future from being entitled to receive a just and reasonable compensation for the service rendered. On the other hand, the commission in the argument at bar does not contend that it possessed the indeed abnormal and extraordinary power which the railways thus say was exerted in rendering the order complained of, a power which if it obtained would open a vast field for the exercise of discretion, to the destruction of rights of private property in railways, and

would in effect assert public ownership without any of the responsibilities which ownership would imply. While it is not denied on behalf of the commission that that body may have considered the prior rate prevailing in the Willamette Valley, the period during which it had been in force, and the effect upon the business situation in the valley of a change to a higher charge, all of these things it is insisted were not made the basis of the power exerted, but were simply taken into consideration as some of the elements proper to be considered in the ultimate exertion of the lawful power to forbid an unjust and unreasonable rate and fix a reasonable one."

The court concludes that the commission's order was void, because it was made in consequence of the assumption by the commission that it possessed the extreme powers described. The thing complained of was not the intrinsic unreasonableness of the \$5 rate, but the injury it was thought would be suffered from not continuing the old rate in force.

Continuing, the court says:

"While it is true that the opinion of the commission may contain some sentences which, when segregated from their context, may give some support to the contention that the order was based upon a consideration merely of the intrinsic unreasonableness of the rate which was condemned, we think when the opinion is considered as a whole in the light of the condition of the record it clearly results that it was based upon the belief by the commission that it had the right under the law to protect the lumber interests of the Willamette Valley from the consequences which it was deemed would arise from a change of the rate, even if that change was from an unreasonably low rate which had prevailed for some time to a just and reasonable charge for the service rendered for the future. Manifestly, this was deemed by the commission to be the power which was being exerted, since Mr. Commissioner Harlan, joined by the chairman of the commission, dissented on the ground that the order was an exertion of a power not possessed to give effect to a supposed equitable estoppel, and no language was inserted in the opinion to indicate to the contrary."

The exclusion of Portland from the benefit of the reduced rate confirms the view that the commission was not merely exercising the right to correct an unreasonable rate.

It was further claimed that the suit should be dismissed, because the order of the commission had expired by the two-year statutory limitation, but the court rejects this argument on the same grounds as those set forth in the case of the Southern Pacific Terminal Company, reported in the *Railway Age Gazette* of March 17, page 519. Moreover, it is possible that the railways will be liable for reparation, because of the influence and effects of the existence of the order of the commission.

FOREIGN RAILWAY NOTES.

Plans are well under way for the construction of an 800-mile railway in Asia Minor. The line will start at Ymurtalik, on the gulf of Alexandretta in the eastern Mediterranean, and run westerly bisecting the Bagdad Railway at Urfa; thence to Lake Van on the confines of the Persian province of Azer Bidjan. It will be a single line, standard gage. It is said that the German opposition is confined to commercial circles. The enterprise is backed by a group of American financiers under the chairmanship of Charles A. Moore of New York.

The report for the whole German empire for 1909 shows that it then had 36,320 miles of railway, an increase of 19.2 per cent. in ten years. There was 1 mile for every 1,872 inhabitants in 1909 (against 1 mile to 380 inhabitants in the United States). The traffic in 1909 was equivalent to a movement of 789 passengers and 1,267 tons of freight each way daily over the entire system, an increase of 52 per cent. in the density of passenger traffic and 24.4 per cent. in the density of freight traffic in ten years. In the United States in 1909 the passenger traffic was equivalent to 174 passengers and the freight traffic to 1,320 tons each way daily. Thus the density of passenger traffic was $4\frac{1}{2}$ times as great on the German roads; but the density of freight traffic was 4 per cent. less than in the United States. The average passenger rate was 0.904 cent per mile in Germany and the average freight rate 1.27 cents per ton-mile, against 1.928 cents per passenger mile and 0.763 cent per ton-mile in this country.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Stanley A. Beard has been appointed a general attorney of the Sabine & Northern, with office at Houston, Texas.

Kingdon Gould has been elected a vice-president of the Texas & Pacific, an additional vice-presidency having been created.

George J. Gould has resigned as president of the Missouri Pacific, and has been elected chairman of the board. The presidency has been left vacant with the expectation of filling it in the near future.

Operating Officers.

John C. Collins, general manager of the Bartlett-Florence Railway, with office at Bartlett, Texas, has resigned to accept service with another company.

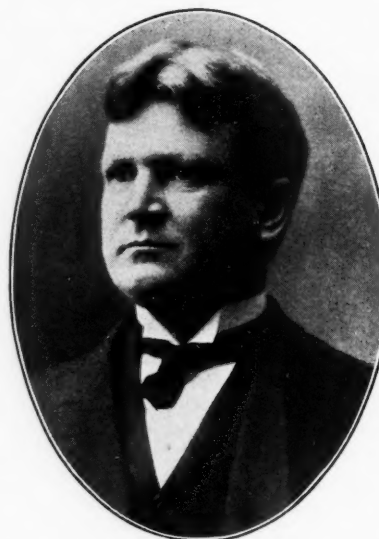
J. F. Hickey has been appointed an assistant division superintendent of the Missouri, Kansas & Texas, with office at McAlester, Okla., succeeding R. L. Gardner, resigned.

J. W. Farrell, trainmaster of the Third district of Grand Trunk, at Richmond, Que., has been appointed trainmaster of the First district, with office at Island Pond, Vt. R. P. Smallhorn succeeds Mr. Farrell.

E. F. Potter, general superintendent of the Chicago division of the Minneapolis, St. Paul & Sault Ste. Marie, has been appointed assistant to the general manager, with office at Minneapolis, Minn., and his former position has been abolished.

E. S. Koller, division superintendent of the Chicago, Burlington & Quincy at McCook, Neb., has been appointed general superintendent of the Illinois district, with office at Galesburg, Ill., succeeding Hale D. Johnson, deceased. E. Flynn, superintendent of the Omaha division at Omaha, Neb., succeeds Mr. Koller, and A. G. Smart, trainmaster at McCook, succeeds Mr. Flynn.

Richard Lincoln O'Donnel, who has been appointed general superintendent of the Western Pennsylvania division of the Pennsylvania Railroad, with office at Pittsburgh, Pa., as has



R. L. O'Donnel.

been announced in these columns, was born on November 5, 1860, at Philadelphia, Pa. He graduated from the Philadelphia High School in 1877, and from the Polytechnic College of Pennsylvania in 1882. Mr. O'Donnel began railway work in the same year as a rodman on the Cornwall & Lebanon, and in 1883 entered the engineering department of the Pennsylvania Railroad. From 1884, to November, 1886, he was draftsman in the assistant engineer's office of the West Penn division, and then became assistant engineer at Altoona. In March, 1887, he was appointed assistant supervisor at Hollidaysburg, and in February of the following year, was transferred in the same capacity to the Philadelphia division. In 1889 he was again transferred to the Pittsburgh division, and in November he was made supervisor in the Altoona yard. In April, 1891, he became assistant engineer of the Tyrone division. From December, 1894, to February, 1897, he was assistant engineer of the Pittsburgh division, and was then promoted to assistant superintendent, becoming superintendent in January, 1902, of the same division. Mr. O'Donnel was appointed general superintendent of the Buffalo & Allegheny

Valley division in January, 1903, which position he held at the time of his recent appointment.

C. B. Gorsuch, superintendent of the Wheeling division of the Baltimore & Ohio, at Wheeling, W. Va., has been appointed superintendent of the Pittsburgh division, with office at Pittsburgh, Pa., succeeding E. A. Peck, promoted. A portrait of Mr. Gorsuch and a sketch of his railway career were published in the *Railway Age Gazette* of May 13, 1910, page 1232. John F. Keegan, trainmaster of the Cumberland division, at Keyser, W. Va., succeeds Mr. Gorsuch.

Traffic Officers.

W. H. Bartlett has been appointed a commercial agent of the Illinois Central, with office at Owensboro, Ky.

G. N. Snyder has been appointed assistant coal traffic manager of the Pennsylvania Lines east of Buffalo, N. Y., with office at New York.

H. M. Tait has been appointed a general agent in the passenger department, Atlantic service of the Canadian Pacific, with office at Minneapolis, Minn., succeeding T. J. Burns, resigned.

Henry E. Jarman, traveling freight and passenger agent of the Delaware, Lackawanna & Western, at San Francisco, Cal., has been appointed Pacific coast agent, succeeding H. N. Butterfield, resigned.

T. H. Jones has been appointed a traveling immigration agent of the Southern Railway, with office at St. Louis, Mo., and J. B. Finster has been appointed a traveling immigration agent, with office at Washington, D. C.

C. H. Pugh, live stock agent of the Missouri Pacific at East St. Louis, Ill., has been appointed a traveling freight agent, with office at Houston, Texas, succeeding W. F. Bellairs, resigned to engage in other business.

R. Creelman, assistant general passenger agent of the Canadian Northern, at Winnipeg, Man., has been appointed general passenger agent of the lines west of Lake Superior; Osborne Scott succeeds Mr. Creelman, both with offices at Winnipeg.

David Northup, contracting freight agent of the Chicago Great Western at Omaha, Neb., has been appointed a commercial agent, with office at Omaha. Ralph G. Adams has been appointed a traveling freight agent, with office at Omaha, succeeding J. H. Cummings, resigned.

C. F. Smith, general agent of the Louisiana Railway & Navigation Company at Dallas, Texas, has been appointed a commercial agent, with office at Oklahoma City, Okla., and the office of traveling freight agent at Oklahoma City has been abolished. E. L. Whitney succeeds Mr. Smith at Dallas.

L. W. Landman, general passenger agent of the Lake Erie & Western at Indianapolis, Ind., has been appointed general passenger agent of the Michigan Central, with office at Chicago. J. S. Hall, assistant general passenger agent of the Michigan Central at Detroit, Mich., succeeds Mr. Landman at Indianapolis.

Daniel C. Fisk, Jr., traveling freight agent of the Union Pacific, the Oregon Short Line and the Oregon-Washington Railroad & Navigation Company, at Philadelphia, Pa., has been appointed contracting freight agent, with office at New York, succeeding F. A. Bradley, resigned. Roger B. Hollinger, soliciting agent at Philadelphia, Pa., succeeds Mr. Fisk, and Howard E. Ohl succeeds Mr. Hollinger.

B. F. Moffatt, general agent in the traffic department of the Minneapolis & St. Louis and the Iowa Central at St. Paul, Minn., has been appointed a commercial agent, with office at Omaha, Neb., succeeding Morell Law, assigned to other duties. W. E. Witherspoon, city passenger and ticket agent at St. Paul, Minn., succeeds Mr. Moffatt. G. W. Harris has been appointed a traveling freight agent, with office at Mason City, Iowa.

Malone Joyce, formerly general agent of the Colorado Midland, with office at Los Angeles, Cal., has been reappointed to that position, the company having reopened its office at that place. P. J. Murphy, formerly contracting agent at Denver, Colo., has been appointed a general agent, with office at Omaha, Neb., and C. L. Brown, traveling freight agent at San Francisco, Cal., has been appointed a general agent, with office at San Francisco.

F. A. Nancekevill has been appointed general agent of the Minneapolis, St. Paul & Sault Ste. Marie, at Toronto, Ont., a new agency. R. G. McCraw, traveling freight agent at Detroit, Mich., has been transferred to Toronto, Ont., and George C. Wilson, traveling freight agent of the Ontario district, has been appointed traveling freight agent of the New York territory, with office at Buffalo, N. Y., succeeding F. F. Johnson, who has been transferred to Boston, Mass.

E. J. Naylor, general agent in the traffic department of the Chicago & Alton, and the Toledo, St. Louis & Western at Los Angeles, Cal., has been appointed general agent in the traffic department, with office at San Francisco, Cal., succeeding C. B. Condon, resigned to engage in other business. J. A. Fitzpatrick, general agent in the traffic department at Buffalo, N. Y., succeeds Mr. Naylor, and C. F. Vigor, traveling freight agent at Pittsburgh, Pa., succeeds Mr. Fitzpatrick. John H. Walkmeyer, chief clerk to the general agent in the freight department at Pittsburgh, succeeds Mr. Vigor.

Engineering and Rolling Stock Officers.

M. H. Sheeley, roadmaster of the Iowa Central, with office at Marshalltown, Iowa, has resigned to engage in other business.

F. Hume has been appointed superintendent of machinery of the Fort Dodge, Des Moines & Southern, with office at Boone, Iowa.

P. H. Rephorn, general foreman in the motive power department of the Delaware, Lackawanna & Western, at Scranton, Pa., has resigned to go to E. L. Post & Co., New York.

Charles Nathan Page, whose appointment as master mechanic of the Lehigh Valley, with office at Anburn, N. Y., has been announced in these columns, was born on June 25, 1868, in Frederick county, Md., and was educated in the common schools. He began railway work in 1884, as a machinist's apprentice on the Baltimore & Ohio, resigning from that position in 1886. He was then for five years in the quartermaster's department of the United States Government. Mr. Page returned to railway work as a locomotive fireman on the Baltimore & Ohio, and was later promoted to engineer. In 1893, he went to the Lehigh Valley in the same capacity, and in 1902 was made road foreman of engines, with office at Buffalo, N. Y.



C. N. Page.

He was appointed trainmaster in 1910, and was recently appointed master mechanic, in addition to his duties as trainmaster, with office at Auburn.

Frank H. Reagan, whose appointment as superintendent of shops of the Delaware, Lackawanna & Western, at Scranton, Pa., has been announced in these columns, was born August 13, 1872, at Corry, Pa. He was educated in the common schools and began railway work in 1892 as a machinist on the Lehigh Valley. The following year he went to the Lake Shore & Michigan Southern as a machinist at the Buffalo shops, and was later engine house foreman at that place. He was then appointed assistant engine house foreman at West Seneca, and later was made night engine house foreman at Collinwood, Ohio. His next position was engine house foreman at Youngstown, and he was later appointed general engine house foreman at Ashtabula. In May, 1907, he was appointed erecting shop foreman at the Collinwood shops, and in November of the same year was promoted to general foreman. He was appointed assistant superintendent of the Collinwood shops in May, 1909, and the following April was promoted to superintendent of the same shops. Mr. Reagan left the service of the Lake Shore in May, 1910, to

become master mechanic of the Lake Erie & Western, which position he held at the time of his recent appointment as superintendent of shops of the Delaware, Lackawanna & Western, at Scranton, Pa.

Purchasing Officers.

Sydney B. Wight, purchasing agent of the New York Central Lines, at New York City, has been appointed general purchasing agent, succeeding F. H. Greene, whose resignation has already been announced in these columns. W. C. Bower, chief clerk in the office of the president, succeeds Mr. Wight, with office at New York.

OBITUARY.

Nathaniel Thayer, a director in the New York, New Haven & Hartford, and many other railway companies, and also in the United States Steel Corporation and the American Telephone & Telegraph Company, died at his home in Boston on Tuesday of this week, at the age of 59. Mr. Thayer had taken an important part in the construction of a number of railways in the West.

F. H. Lord, formerly for 10 years (1891-1901) general passenger and ticket agent of the Chicago Great Western, died recently at his home in Oakland, Cal. Mr. Lord was born December 12, 1849, at Utica, N. Y., and entered the passenger department of the Detroit & Bay City, at Bay City, Mich., in 1873. He was later a traveling passenger agent of the Canada Southern and then went to Chicago as district passenger agent and land agent of the Northern Pacific. He went to the Chicago, St. Paul & Kansas City in 1889, remaining with that company and its successor, the Chicago Great Western, until 1901. In that year he resigned and was appointed district passenger agent of the Chicago, Rock Island & Pacific, at Des Moines, Iowa.

David H. Moffat, of Denver, Colo., president of the Denver, Northwestern & Pacific, died suddenly in New York City, March 18, the cause of death being given as heart disease. Mr. Moffat has been one of the most prominent capitalists in Colorado for many years, having been interested in real estate and railways. At one time he was said to have had extensive interests in 125 mining companies. He was born in Orange county, New York, in 1839, and went West at an early age. He organized the First National Bank of Denver, when that city was a mere settlement; and was prominent in the construction of the Denver & Rio Grande, the Denver Pacific, the Denver & New Orleans and the Florence & Cripple Creek. The D. N. W. & P. is Mr. Moffat's latest enterprise. The road is now in operation from Denver to Steamboat Springs, Colo., 214 miles.

John B. McDonald, the well-known railway contractor, and builder of the first New York subway, died at his home in New York City on March 17. Mr. McDonald was born in Ireland in 1844, and at the age of three years came with his parents to this country. He became a contractor at an early age, but for a time he was inspector of masonry on the Fourth avenue tunnel of the New York Central & Hudson River. Some of his important railway construction contracts were on the West Shore; in the Potomac valley; on an extension of the Illinois Central from Elgin to Wisconsin; the Trenton cut-off of the Pennsylvania; and the extension of the Baltimore & Ohio from Baltimore to Philadelphia. He was a subcontractor on the Boston, Hoosac Tunnel & Western; on the Canadian Pacific, and on the extension of the Delaware, Lackawanna & Western from Binghamton, to Buffalo. He first came into national prominence when he built the two-mile underground line of the Baltimore & Ohio through the city of Baltimore in 1890. This line, cut through a busy street for its whole length, involved many difficulties. In January, 1900, he took the contract to build the subways in New York City, for \$35,000,000, and formed a company for the purpose. He had general oversight of the work up to the time of its completion, and it was finished within the stipulated time.

The number of passengers killed or injured in Germany per 1,000,000 carried was 0.58 in 1900 and 0.42 in 1909, which latter year was distinguished by the exceptionally fatal Mülheim disaster. The average number of passengers killed in the last ten years is 0.9 per million carried.

Railway Construction.

New Incorporations, Surveys, Etc.

ALBERTA CENTRAL.—Bids are now being asked, it is said, for building this line. The headquarters of the company are at Lethbridge, Alb.

ARDMORE, DUNCAN & LAWTON.—This company has not yet completed its organization. The plans call for a line from Lawton, Okla., southeast via Duncan and Ardmore, to Sherman, Texas, about 125 miles. It is expected that contracts will be let during the latter part of May. There will be about six steel bridges, a number of station buildings and shop buildings. R. L. Robertson, Lawton, may be addressed. (See Lawton, Duncan & Ardmore, March 10, p. 479.)

ARKANSAS CITY, WELLINGTON & NORTHWESTERN.—This company was recently incorporated in Kansas to build from Arkansas City, Kan., northwest to Hutchinson, about 85 miles, and a construction company was organized to carry out the work. G. H. Hunter, president, Wellington.

BUFFALO, LOCKPORT & ROCHESTER (Electric).—An officer writes that work is now under way laying second-track on 3.5 miles, and on another section of 1.5 miles on the eastern end of this road; also, on the elimination of a grade crossing at South Greece. All the work will be carried out by the company's men and is expected to be finished early in June. Grading for this second-track, with the exception of the elimination of grade crossing was done on the original construction.

BUFFALO, ROCHESTER & PITTSBURGH.—An officer writes that the Miller Construction Company, Lock Haven, Pa., has a contract for work on two miles of line revision and double-tracking between Hutchins, Pa., and Midmont. (March 17, p. 525.)

CANADIAN NORTHERN.—According to press reports, contracts have been given to the Cowan Construction Company and the Northern Construction Company, amounting to \$8,000,000, to build new lines. The most important line to be finished during 1911 will be the one from a point near Red Deer, Alb., south to Calgary. The company expects to finish about 200 miles of main line west of Edmonton this year.

CANADIAN PACIFIC.—A contract has been given to J. D. McArthur, to build a branch from Estevan, Sask., to a point 55 miles west of that place.

Contracts are said to have been given recently by this company for building lines in western Canada as follows: Two lines out of Swift Current, Sask., 80 miles; from Moose Jaw, 35 miles, and from Lacombe, Alb., 60 miles, to Foley, Welch & Stewart, St. Paul, Minn.; three branch lines out of Wilkie, Sask., 82 miles to W. A. Dutton, Calgary, Ill., and for double-track work from Moose Jaw, Sask., west for 23 miles and east for 10 miles, to J. G. Hargrave & Co., Winnipeg, Man.

An officer writes that contracts have been let to Janse, McDowell & Co., Calgary, Alb., for building 42 miles of the Kootenay Central south of Golden, B. C. (March 10, p. 479.)

The line between Macklin, Sask., and Korrobert has been opened for traffic.

CHESAPEAKE & OHIO.—This company is building a 10-mile branch into the property of the Cole & Crane Co., consisting of 90,000 acres of coal and timber lands in West Virginia. The line is being built to secure an outlet for the timber of the Cole & Crane Co., via the Chesapeake & Ohio, to Cincinnati, Ohio. It is expected that the line will be in operation by August. C. Crane is general manager of the C. & C. Co., Cincinnati.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—See report of this company elsewhere in this issue.

CRYSTAL CITY & UVALDE.—An extension is to be built from Gardendale, Texas, east about 30 miles. Some of the right-of-way has been secured.

DURHAM & DANVILLE.—Incorporated in North Carolina to build a 51-mile line. It is expected that the work will be finished during the next two years. The incorporators include: J. F. Wily, W. F. Carr, C. C. Thomas and W. B. Guthrie.

EASTERN MAINE.—A favorable report has been made by the committee on the application of this company for a charter in Maine, but neither branch of the state legislature has yet acted on the bill. The company asks permission to build 108 miles of line from a point at tidewater in Brewer, Me., opposite the city of Bangor, Penobscot county, easterly via Holden, Eddington, Clifton, thence northerly via Amherst, Great Pond, Lakeville Plantation, Springfield, Carroll and Prentiss, thence northerly via Bancroft, Haynesville and Hodgdon to Houlton, Aroostook county. The incorporators include: E. H. Blake, W. L. Miller, A. A. Merrill, C. P. Thomas, A. Warren and A. G. Chambers. (March 10, p. 478.)

GRAND TRUNK PACIFIC.—Considerable progress has been made on the construction of the mountain section, both westward from Wolf creek and eastward from Prince Rupert, B. C. There remains only about 400 miles of line not yet under contract, for which bids will be asked during the next two months. When these contracts are let, the entire line from Prince Rupert, east via Edmonton and Winnipeg to Fort William, at the head of Lake Superior, 2,188 miles, will be either under construction or completed.

GREAT NORTHERN.—The branch from Bainville, Mont., north to Plentywood, 53.44 miles, was opened for business on March 13. (December 2, p. 1096.)

KOOTENAY CENTRAL.—See Canadian Pacific.

LAKE SHORE & MICHIGAN SOUTHERN.—See report of this company elsewhere in this issue.

LAWTON, DUNCAN & ARDMORE.—See Ardmore, Duncan & Lawton.

LEHIGH VALLEY.—According to press reports, this company has recently decided to make the single-track line, now under construction from Lumber Yard, Pa., to a connection with the main line at Hayes creek, 12 miles, a double-track line. The original cost, which was \$1,500,000, including classification yard, engine house, shop for car repairs and fuel and water facilities, it is understood, will be increased to \$2,200,000. Hyde, McFarland & Burke are the contractors. Grading work on the line is more than half finished. (August 19, p. 332.)

MICHIGAN CENTRAL.—See report of this company elsewhere in this issue.

MILWAUKEE NORTHERN (Electric).—This company contemplates double-tracking its lines in the near future from Milwaukee, Wis., north to Cedarburg. Also, building an extension from Cedarburg northwest, via West Bend, Barton, Kewaskum, Campbellsport and Eden to Fond du Lac.

MILWAUKEE, PEORIA & ST. LOUIS.—Incorporated in Illinois with \$5,000 capital, to build from Peoria, Ill., north through the counties of Tazewell, Woodford, Marshall, Putnam, Bureau, Lee and Ogle to Rockford, in Winnebago county, about 120 miles. The headquarters of the company will be at Chicago. The incorporators include: E. C. Morton, F. C. Vehmeyer, J. H. O'Neil, F. B. Reed and F. Gardiner, Chicago.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—An officer is quoted as saying that a line is to be built during 1911 from the Brooten-Duluth line, near Foxboro, Wis., south to Frederic, 65 miles; also, that a line from Fordville, N. D., west to Drake will be built when conditions warrant.

NEW YORK CENTRAL & HUDSON RIVER.—See report of this company elsewhere in this issue.

OREGON ELECTRIC.—An officer is quoted as saying that work is to be started soon on an extension from Salem, Ore., south to Eugene, about 65 miles.

OREGON TRUNK RAILWAY.—An officer writes that there is no immediate prospect of building this line south of Bend, Ore. Track has already been laid on 115 miles, from Fallbridge, Wash., to Metolius, Ore. No further contracts will be let at present. The grading work on the first 110 miles from Fallbridge was carried out by Porter Brothers, Portland, Ore., and from that point to Bend, 46 miles, by H. C. Henry & Co., Seattle, Wash. The first 110 miles follows the Des Chutes and Willow creek canyons; the work on this section was extremely heavy, being practically all through solid rock. The remaining 46 miles to

Bend is through a scab rock country, requiring an even number of cuts and fills. The material handled was mostly rock. The roadbed has been graded to Bend. Maximum curvature, Fallbridge to Madras, Ore., 6 deg.; Madras to Bend, 3 deg. Maximum grade, Fallbridge to Metolius, 0.6 per cent., with 20 miles of 1.3 per cent. pusher grade from Mecca to Metolius. This grade is all ascending towards Metolius. Maximum grade from Metolius to Bend is 1 per cent. against southbound, and 0.5 per cent. against northbound trains. There will be a steel bridge over the Columbia river, 2,427 ft. 8 in. long, with approaches of 1,734 ft.; also one at the first crossing of the Des Chutes river, 465 ft. long, and another at the second crossing, 510 ft. long. Steel bridges will also be built over White river, Wapinitia creek, Nena creek, Eagle creek; third crossing of Des Chutes river, and over Trout creek, varying in length from 112 ft. to 175 ft. each, and a steel bridge over Crooked river, 460 ft. long. There is also a large amount of trestle work. The steel bridges, including substructures, have all been designed and are being constructed under the direction of Ralph Modjeski. A terminal yard, including fuel, oil and engine house facilities, is being built at Fallbridge, and a freight terminal is under construction at Metolius. The principal commodities to be carried on the line are: wheat, live stock and lumber, from central Oregon, and merchandise and manufactured goods into central Oregon.

OREGON-WASHINGTON RAILROAD & NAVIGATION COMPANY.—A contract has been given to the Twohy Brothers Construction Company, Pendleton, Ore., to build the Echo-Coyote cut-off in Oregon. (See Oregon Railroad & Navigation Company, September 10, p. 483.)

PARIS & MOUNT PLEASANT.—This company, which operates 23.6 miles of line from Paris, Texas, to Bogota, is planning to extend the line southeast to Mount Pleasant, 32 miles.

PAYSON ELECTRIC.—This company is planning to build a line from Salt Lake City, Utah, south to Payson, about 60 miles. The headquarters of the company are at Salt Lake City.

PENNSYLVANIA ROADS.—According to press reports, plans have been made by the Stony Brook Lumber Company, to build an eight-mile line to a connection with the Lehigh Valley, at Lopez, Sullivan county, Pa.

QUEBEC & SAGUENAY.—An officer writes that contracts are to be let at once to build from a point 30 miles northeast of Quebec, Que., on the north shore of the St. Lawrence river, at the present terminus of the Quebec Railway, northeast to Murray bay, 63 miles. Much of the work will be heavy rock work, involving the handling of about 30,000 cu. yds. a mile. There will be five steel bridges and probably two short tunnels. The line is being built to carry wood products, iron and other ores. R. Forget, president, and Arthur H. N. Bruce, chief engineer, Castle building, Ottawa, Ont., and Quebec, Que. (February 17, p. 334.)

RICHMOND & URBANNA.—An officer writes that the plans call for a line from Richmond, Va., east to Urbanna, about 55 miles. The company has secured seven miles of electric line now in operation, with terminals in Richmond. It has not yet been decided when work will be started on the line, or whether steam or electricity will be used for the motive power. J. C. Robinson, Richmond.

SIoux FALLS & SIoux CITY (Electric).—An officer writes that the company plans to begin work at once from Sioux Falls, S. D., south via Canton, Beresford and Elk Point to Sioux City, Iowa, about 90 miles. The general contract has been given to O. F. Spaete, Sioux Falls, S. D. There will probably be two small steel bridges over Big Sioux river. The plans call for putting up car barns, stations, etc. J. Wolflin, superintendent, Sioux Falls.

SOUTHERN PACIFIC.—This company, it is said, will build the line through the Sacramento Valley, from Arbuckle, Cal., north to Hamilton. (July 22, p. 174.)

ST. LOUIS & SAN FRANCISCO.—An officer writes that work is now under way laying about eight miles of yard tracks at Bellevue, Tenn., near Memphis, and making other improvements, to include one 175-ft. steel bridge, a six-stall roundhouse, a 120-ft. cinder pit, and a 75-ft. turntable. The grading contract has been given to J. H. Weatherford, Memphis, and for the buildings to

the Jarrett Construction Company, Springfield, Mo. Laying and surfacing tracks will be carried out by the company's men.

SUGARLAND & ARCOLA.—This company is building an extension from Arcola, Texas, south to the port of Velasco at the mouth of the Brazos river, and arrangements are being made for the early construction of a northern extension from Sugarland to Hempstead, about 55 miles. The proposed extensions will aggregate more than 100 miles. The road is at present only 14 miles long, running between Sugarland and Arcola. When finished these extensions will form a new north and south line through the rich valley of the Brazos river.

TENNESSEE, ALABAMA & GEORGIA.—According to press reports, work has been started on the extension between Rockmart, Ga., and Rome, 29 miles, and work will be started soon from Harrisburg, east to Gore, eight miles. (Jan. 20, p. 144.)

TEXAS ROADS (Electric).—According to press reports, the Stone & Webster, Boston, Mass., interests, are planning to build a line from Waxahachie, Texas, north to a connection with the Northern Texas Traction at Oak Cliff, about 30 miles. Right-of-way will be secured at once, and it is expected to have the line in operation this year.

TRINITY VALLEY TRACTION.—An officer writes that the company plans to build this year from Dallas, Texas, southeast via Waxahachie and Corsicana to Palestine, 118 miles. About three-quarters of the line will be over a level prairie and the remaining quarter will have some cuts and fills. There will be three small bridges, and two power plants. J. V. Watkins, 304 Scollard building, Dallas.

UTAH ROADS.—An officer of the Union Coal Company, Salt Lake City, Utah, writes that contracts will be let in April to build an eight-mile line from Helper, on the Denver & Rio Grande, north to coal fields in Carbon county. There will be one steel bridge, about 50 ft. long. A. N. Holdaway, vice-president and acting manager, 504 McIntyre building, Salt Lake City. (March 17, p. 526.)

VALDOSTA, MOULTRIE & WESTERN.—An officer writes that contracts will be let at an early date to build an extension from Moultrie, Ga., west. The work includes building a drawbridge over the Flint river.

VERA CRUZ, TABASCO & CAMPECHE.—According to press reports, surveys are now being made from Santa Lucrecia, Mex., on the Tehuantepec National, east to Campeche, on the United Railways of Yucatan, 490 miles. Donato de Chapeaurogue, president, and A. L. Van Antwerp, secretary, Apartado 870, city of Mexico. (August 19, p. 332.)

WINNIPEG NORTHERN.—Surveys are now being made from Winnipeg, Man., northerly along the east shore of Lake Winnipeg. George Franklin, Selkirk, Man., is interested.

FOREIGN RAILWAY NOTES.

In New Zealand during 1910 ten new sections of railways were opened, aggregating 61 miles.

The Argentine congress has recently enacted a law authorizing the construction of a narrow-gage railway line which, starting at the village of Tinogasta, in Catamarca, will run as far as the Chilean frontier in San Francisco pass. The line will cover a distance of 147 miles, and is estimated to cost \$8,122,000. At San Francisco it may connect with a branch line of the Copiapo or the Taltal Railway, thus forming another trans-Andean line.

In 1906 a tax on railway tickets was imposed throughout the German empire, only fourth class tickets being exempt. The most notable effect of this tax has been the diversion of travel from the higher to the lower classes. This has occurred especially in the first class. In 1905 there were 2,681,000 first-class tickets sold, in 1909 only 1,624,000. The first-class earnings, which normally would have increased in this period \$1,200,000, actually decreased by \$600,000. There has also been a diversion from the second to the third class; but this has in good part been due to improvement in the third-class service; most of the fast trains now having third-class cars. The tax is to be continued, but is to be modified.

Railway Financial News.

CINCINNATI, BLUFFTON & CHICAGO.—The order of the court for the sale of this road on March 15 was not carried out, no bids having been received. The sale is now set for March 25.

GREAT NORTHERN.—In the table of earnings and expenses of railways, page 298 of the *Railway Age Gazette* of February 10, net operating revenue for the Great Northern was shown as \$2,646,558 for the month of December, 1910, whereas the correct figure is \$2,011,558. The error was a typographical one and did not affect any of the other figures given.

MIDDLETOWN, UNIONVILLE & WATER GAP.—Suit has been begun in the supreme court of New York, in Orange county, to foreclose the second mortgage of \$250,000, which was due on June 1 last, and which has not been paid. The bondholders' committee is represented by G. M. Cumming. The road is leased to and controlled by the New York, Susquehanna & Western.

MISSOURI, KANSAS & TEXAS.—The 5 per cent. notes of this company, amounting to \$10,000,000, which are to be paid on May 1, will be taken up by the issue of two-year notes at the same rate, and which have been sold to Speyer & Co. The bankers have offered the notes for sale at 99, deliverable on May 1, but it is said a large portion of the amount offered was taken up by buyers on the first day. The new issue amounts to \$12,500,000, and 2½ millions will be used for making improvements and for buying new cars and engines.

MISSOURI PACIFIC.—The recently elected Board of Directors has chosen George J. Gould as chairman, leaving the presidency vacant, with the expectation that the place will soon be filled. F. T. Gates, George J. Gould, E. D. Adams, E. T. Jeffery, Edwin Gould and Cornelius Vanderbilt were elected to the executive committee. Messrs. Gould, Gates and Adams have been appointed a special committee to find a president. The directors of the St. Louis, Iron Mountain & Southern have appointed as executive committee George J. Gould, Kingdon Gould, E. T. Jeffery, E. L. Marston, E. D. Adams, Paul Warburg and R. M. Gallaway. The directors of the Texas & Pacific, which is classed as still a "Gould road," elected Kingdon Gould a vice-president, and E. L. Marston, of Blair & Co., a member of the executive committee to succeed J. J. Slocum, who, however, remains a member of the board. Henry Cooper was elected a director to succeed Alvin Krech, resigned.

PENNSYLVANIA.—The Bedford & Hollidaysburg Railroad Company has increased its capital stock from \$30,000 to \$600,000.

The Pennsylvania has sold to Speyer & Co. first mortgage 4 per cent. gold bonds of the Philadelphia, Baltimore & Washington to the amount of \$4,500,000. These bonds, due in 1943, are issued to retire 6 per cent. bonds of the Baltimore & Potomac falling due April 1 and July 1 next. It is understood that holders of the old bonds, wishing to exchange, will be given by the bankers the first opportunity to take the new bonds.

PERE MARQUETTE.—Five year notes of this company, amounting to \$8,000,000 and bearing interest at 6 per cent., have been sold in New York. The proposal to issue these notes was agreed upon by the dominant interests last month, when J. P. Morgan & Co. bought from the C. H. & D. an important interest in the P. M., as noted in this column March 3, page 434.

TENNESSEE, ALABAMA & GEORGIA.—The State Railroad Commission of Georgia has given authority for the issue of \$8,100,000 in stock and bonds by this company. The bonds, amounting to \$5,000,000, are to be used in part to pay the debts of the predecessor company, the Chattanooga Southern; and the remainder, together with the stock, will be used for new construction, principally the proposed line to make a direct connection with Atlanta, as noticed in the *Railway Age Gazette* December 23, page 1205, and January 20, page 144. The trustee of the bonds is the Empire Trust Company, New York City.

WASHINGTON, BALTIMORE & ANNAPOLIS.—This electric inter-urban railway was sold at Annapolis Junction, Md., last week by order of the United States Court to satisfy the first mortgage of \$3,000,000, and the second mortgage of \$1,000,000. The property was bid in for \$2,501,000 by G. A. Craig, representing a re-organization committee.

Supply Trade Section.

P. H. Rephorn, general foreman of the Delaware, Lackawanna & Western at Scranton, Pa., has resigned and is now with E. L. Post & Co., New York.

The Pennsylvania Equipment Company is in the market for two secondhand standard gage, six-driver switching locomotives to weigh 50 to 75 tons on drivers, for prompt delivery.

The Link Belt Company, Chicago, announces the change in location of its Boston sales office from 84 State street to 131 State street. Lawrence Spillan will be in charge of the new office.

Clarence E. Delafield has been made a district manager of the Crocker-Wheeler Company, Ampere, N. J., succeeding R. N. C. Barnes, resigned. Mr. Delafield's headquarters will be in Boston, Mass.

The Willard Storage Battery Company, Cleveland, Ohio, started work on an addition to its plant during the first week of March. When completed this new building will add 8,000 sq. ft. of floor space to the present plant.

Theodore L. Condon, civil engineer, 1214-15 Monadnock Block, Chicago, announces that he will continue under his own name the engineering practice lately carried on by Condon & Sinks. Mr. Sinks has withdrawn to locate in Seattle, Wash.

A. Eugene Michel, advertising engineer, New York City, announces that Professor W. F. Schaphorst, of the mechanical engineering department of the New Mexico College of Mechanic Arts, has resigned to become a technical writer on his advertising staff.

The Okadee Company (not incorporated) has taken offices in the Old Colony building, Chicago. This company will make and sell the Okadee blow-off valve and other railway devices. A. G. Hollingshead is president and manager, and H. L. Winslow is vice-president and treasurer.

A. B. Saunders, formerly manager of the electrical department for John B. Watson, Philadelphia, Pa., has established a similar business, including steam railway and contractors' equipment, under the title of A. B. Saunders & Company, with offices at the Witherspoon building, Philadelphia, Pa.

The McIntosh Car Seal & Manufacturing Company, Greeley, Colo., expects to install considerable new machinery and enlarge its business several fold within the next thirty days. This company has been in existence for the last three years and has been operating on a rather small scale, its capacity being about 30,000 seals per day.

T. W. Williams, who has been associated with the General Electric Company, of Schenectady, N. Y., in the gear and pinion department for the past 18 years, has become associated with the Whipple Supply Company of New York, in the capacity of vice-president in charge of sales, and will devote the major portion of his time in the interests of the Tool Steel Gear and Pinion Company's products which this company represents.

The Railway Supply Company, Westfield, N. Y., manufacturers of automatic cylinder cocks, valves and injectors, have been granted one acre of land in Conneaut, Ohio, by the business men's association of that town. The conditions state that they shall start building their factory within 90 days and have it completed within six months. The company has placed some of the contract for a brick structure 100 ft. long and 60 ft. wide.

Tracy W. Guthrie has resigned as president of the Republic Iron & Steel Company, Pittsburgh, Pa., to engage in other business. Mr. Guthrie will continue to temporarily serve the company in a consulting capacity. The vacancy caused by his resignation has been filled by Thomas J. Bray, formerly vice-president. Henry L. Rownd, formerly secretary and treasurer, has been chosen vice-president and treasurer, and Richard Jones, Jr., the general attorney, will also act as secretary.

The annual report of the United States Steel Corporation for the year ended December 31, 1910, shows that the gross sales were \$703,961,424, an increase of \$57,579,173 over 1909. The net

earnings in 1910 were \$116,738,157, an increase of \$8,965,057 over 1909. After deducting bond interest and bond sinking funds and \$25,219,677 for preferred dividends, the balance earned for the \$508,302,500 common stock was \$62,187,508, or 12.23 per cent. as compared with \$78,525,250, or 10.59 per cent. earned in

W. B. Dickson, vice-president of the United States Steel Corporation, has resigned, effective May 1. Judge Gary, referring to the resignation, said in part: "Mr. Dickson has tendered his resignation as vice-president, to take effect May 1, much to my regret, for he has been a most efficient and loyal officer. The resignation will, of course, be accepted. Mr. Dickson has the best wishes of all his associates for the future." Mr. Dickson has been associated with the United States Steel Corporation since its organization. At the time of the merger in 1901 he was assistant to Charles M. Schwab, president of the Carnegie Steel Corporation, Pittsburgh, Pa. He entered the Steel Corporation as one of the vice-presidents, and has held that position ever since. The vice-presidents of the corporation are not classified, but since the resignation of James Gayley about two years ago, Mr. Dickson has been called first vice-president. It is not yet known whether or not a successor will be appointed to fill the vacancy.

TRADE PUBLICATIONS.

Southern Pacific.—In four separate booklets the passenger department of the Southern Pacific illustrates and presents in a most effective way the many attractions and advantages that may be found at Eugene, Ore., Salem, Baker City and Attalia, Wash.

Vanadium Steel.—The American Vanadium Company, of Pittsburgh, Pa., has issued the first number of a publication, which will be issued periodically in the interests of "Amervan" ferro vanadium. It contains a description of the chemical element vanadium, its uses in steel forgings and castings, and gives the physical properties of the steel in which it is used.

Denver & Rio Grande.—The passenger department of the Denver & Rio Grande has published a schedule for the special agricultural demonstration train of the Colorado Agricultural College, which was run March 5 to 16. In addition to the train schedule, the pamphlet lists the exhibits in the different cars and the faculty of the College which had charge of the train.

Southern Railway.—This company has published an 85-page booklet, giving a full list of the fruit, vegetable and melon growers and dealers in the states tapped by the Southern. The information is arranged by states and towns, and includes the names of the growers and dealers, their addresses, the products which they grow or sell, and the number of acres or trees cultivated.

Lubrication.—McCord & Co., of Chicago, have recently published a 37-page booklet giving a short treatise on the subject of friction and showing the advantage of perfect lubrication. It fully describes the McCord system of force feed locomotive lubrication and gives the necessary information to obtain the best results with this lubricator. This company will gladly send a copy of the booklet to any one interested in the subject.

Georgia Southern & Florida.—The land and industrial department of this subsidiary of the Southern Railway has issued a pamphlet list of the fruit, vegetable and melon growers and shippers in the territory tributary to the Georgia, Southern & Florida. The list shows the shipping point, the name of the shipper, his post office address, whether he is a grower or dealer, kind of fruit or vegetable and the number of trees or acreage. The vegetable farms run from a half acre in potatoes and an acre in strawberries to 250 acres in various vegetables, while some of the fruit farms run as high as 60,000 trees.

Northern Pacific.—This company has published a novel little booklet whose pages are cut in the form of a large red apple. It is called "From Office to Orchard," and is the story of a man

who broke away from a city office with an assured salary and started an apple orchard in the Northwest. Briefly and clearly he tells what this change has done for him and what it will do for others. Two other illustrated booklets published by the same company, one on Southwestern Washington and the other on Kittitas Valley, Wash., tell of the moderate prices of land in that region and of the great productivity and diversity of resources.

RAILWAY STRUCTURES.

BELLEVUE, TENN.—See St. Louis & San Francisco under Railway Construction.

BERKELEY, CAL.—A contract has been given by the Southern Pacific to Robert Trost, San Francisco, at \$17,000, for putting up the new power station at Berkeley. (March 3, p. 436.)

BROWNVILLE, TEXAS.—It is expected that work will be started at once by the Trinity & Brazos Valley on a new two-story brick warehouse. The cost of this structure will be about \$60,000.

CALGARY, ALB.—Work is to be started during April, by the Canadian Pacific, it is said, on two bridges to be built over the Elbow river, each to cost about \$150,000. Also on new stations to be built at Calgary, Lacombe, High River and at Claresholm.

CHEHALIS, WASH.—The Northern Pacific will build a station at Chehalis.

CHESTER, PA.—The Baltimore & Ohio and the Philadelphia Rapid Transit Company, it is said, will jointly construct a subway under the tracks of the Baltimore & Ohio at Prospect Park.

CLARESHOLM, ALB.—See Calgary, Alb.

DOVER, DEL.—A contract has been given by the Pennsylvania Railroad, it is said, to Irwin & Leighton, Philadelphia, Pa., to build the new passenger station at Dover. (September 2, p. 442.)

EVERETT, WASH.—Announcement is said to have been made by the Columbia & Puget Sound that the company will at once complete its Everett extensions; terminal facilities and stations will be built, and the block system installed.

The Great Northern has given a contract to Caughren & Wilson for the foundation work on the steel fuel oil tanks at Everett. (December 23, p. 1208.)

FALLBRIDGE, WASH.—See Oregon Trunk Railway under Railway Construction.

FRESNO, CAL.—The Fresno, Hanford & Summit Lake is having plans made for building stations at Fresno, at Kingsburg and at Sanger. The general offices will be located in the station at Fresno, which is to cost \$50,000. The plans are being made by Mathewson & Clark, architects, Fresno.

GARDEN CITY, KAN.—The roundhouse of the Garden City, Gulf & Northern was destroyed by fire on March 13. A locomotive was badly damaged, and the loss included a carload of lumber, tools, pumping engines and other equipment.

GRANGER, WASH.—See, Vale, Ore.

HIGH RIVER, ALB.—See Calgary, Alb.

KINGSBURG, CAL.—See Fresno, Cal.

KINGSVILLE, TEXAS.—Plans and specifications for the three-story brick general office building which the Trinity & Brazos Valley proposes to build have been accepted, and it is expected that work will be started at an early date on this structure, which will cost about \$100,000.

LACOMBE, ALB.—See Calgary, Alb.

METOLIUS, ORE.—A contract has been given by the Oregon Trunk to the Herrick Construction Company, for putting up a new station at Metolius. See Oregon Trunk Railway under Railway Construction.

MERTZTOWN, PA.—The Philadelphia & Reading, it is said, will construct a subway at a dangerous grade crossing in Mertztown.

NEW HAVEN, CONN.—The New York, New Haven & Hartford has decided to build the new passenger station on the site of

the present station, fronting on the harbor, about half a mile from the business center of the city.

NORTH BILLERICA, MASS.—The Boston & Maine has bought about 500 acres of land at this place, about 25 miles from Boston, on which it intends to build car shops. It is understood that the improvements will cost \$3,000,000.

ORELLA, CAL.—The Southern Pacific will build a combined passenger station and freight house at Orella.

SANGER, CAL.—See Fresno, Cal.

SECURITY, TEXAS.—The Gulf, Colorado & Santa Fe expects to build a station to cost between \$3,000 and \$4,000.

SHIBLEY, ARK.—The Arkansas railway commission has ordered the St. Louis, Iron Mountain & Southern to build and equip an adequate freight and passenger station at Shibley, to extend its tracks 300 ft. at Newark, and to build a passenger station at Warren.

VALE, ORE.—The North Coast is planning to build a station at Vale, to cost \$20,000. A station is to be built at Wapato, Wash., and a contract has already been let to Harry Boyer, Granger, for building a station at Granger.

WAPATO, WASH.—See Vale, Ore.

WARREN, ARK.—See Shibley, Ark.

WICHITA, KAN.—At a conference between representatives of the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the St. Louis & San Francisco, and the Kansas City, Mexico & Orient and Mayor C. L. Davidson, it was agreed that work will be commenced within 90 days on the new union station, which is to cost \$2,000,000.

WINNIPEG, MAN.—Bids are wanted by the division engineer of the Canadian Pacific at Winnipeg, Man., until March 27, for building the substructures of bridges and culverts on the Manitoba division, also for a culvert at Kenora, Ont.

FOREIGN RAILWAY NOTES.

Arrangements have been made for floating a loan of \$19,300,000, to be taken up by French banks, for the construction of a railway in southern Asia, which will connect Saigon, Cochinchina and Bangkok, Siam. The road is to be built from Battambang, a frontier city, peopled by Europeans, to Pnom Penh, and from the latter place conveyance will be by boat to Saigon.

The government of Brazil has approved a contract entered into with the Companhia Amparo Industrial for the construction of a line 62 miles in length from Villa Nova, on the Leopoldina Railway, to Santa Rosa, on the banks of the Muriahe river; and thence to Cardoso Moreira, on the same railway, together with a branch running along the Muriahe river as far as Campos, in the state of Rio de Janeiro.

A French syndicate has the contract for the construction of a railway in Ecuador from Bahia de Caraquez to Quito, work on which has already commenced. Formerly a number of American civil engineers were employed in connection with the building of the railway from Guayaquil to Quito, but as the road is completed, all with a few exceptions have left the country. It is possible that this road may be extended and other roads built in the next few years.

During 1910 considerable activity was shown in the initial construction of the Szechuen-Hupeh Railway, China. Early in the spring nearly 10,000 coolies were employed and in November no less than 15,000 were at work on the road. In the construction of this line the best engineering knowledge is necessary, the work being far more difficult than that of any other railway in China. In 15 miles from Ichang through to Wanhhsien numerous tunnels through solid rock will have to be constructed. The longest tunnel is about 6,200 feet long, and is 50 miles distant from Ichang. The contract for this tunnel was let and construction commenced some months ago. Twenty-five miles from Ichang two tunnels of about 1,000 feet each have also been contracted for, and the work begun. The first tunnel of 700 feet on the second section, 15 miles from Ichang, has just been completed. All of the tunneling is done by hand-blasting.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The *Western Maryland*, mentioned in *Railway Age Gazette* of March 10, has ordered five Pacific type locomotives from the Baldwin Locomotive Works.

The *New York, Ontario & Western* has ordered four 10-wheel passenger locomotives from the American Locomotive Company, with cylinders 20 in. x 26 in., driving wheels 69 in., and total weight in working order 178,000 lbs.

The *New York, Chicago & St. Louis* has ordered six consolidation freight locomotives and nine 10-wheel locomotives from the American Locomotive Company. The consolidation locomotives have cylinders 19 in. x 28 in., driving wheels 63 in., and total weight in working order 172,000 lbs. The 10-wheel locomotives have cylinders 19 in. x 24 in., driving wheels 63 in., and total weight in working order 145,000 lbs.

The *Pere Marquette*, mentioned in the *Railway Age Gazette* of March 10 as being in the market for 50 locomotives, has ordered 35 consolidation freight locomotives, 10 six-wheel switching locomotives and five Pacific type passenger locomotives from the American Locomotive Company. The consolidation locomotives have cylinders 22 in. x 30 in., driving wheels 61 in., and total weight in working order 215,000 lbs. The switching locomotives have cylinders 20 in. x 26 in., driving wheels 51 in., and total weight in working order 136,000 lbs. The Pacific type locomotives have cylinders 22 in. x 28 in., driving wheels 77 in., and total weight in working order 215,000 lbs.

The *Illinois Central* has ordered 40 Mikado locomotives from the Baldwin Locomotive Works, as mentioned in the *Railway Age Gazette* of March 10. These locomotives will have the following dimensions and special equipment:

Dimensions.

Gage	4 ft. 8½ in.
Weight on drivers.....	217,000 lbs.
Total weight	280,000 lbs.
Diameter of cylinders.....	27 in.
Stroke of pistons.....	30 in.
Diameter of drivers.....	63 in.
Type of boiler.....	Radial stay.
Working steam pressure.....	175 lbs.
Tubes, outside diameter.....	2 in. and 5¾ in.
Tubes, length	20 ft. 6 in.
Firebox, length	120½ in.
Firebox, width	84 in.
Firebox, material and maker.....	Otis steel.
Grate area	70 sq. ft.
Tank capacity for water.....	9,000 gal.
Coal capacity	15 tons.

Special Equipment.

Axles, main	Heat treated, Standard Steel Works.
Axles, others	Open hearth steel.
Bell ringer	Gollmar.
Brakes	New York.
Brake beams.....	Creco.
Brake shoes	American.
Couplers	Sharon.
Driving boxes	Cast steel.
Headlight	Commercial acetylene.
Injector	Simplex.
Piston and valve rod packings.....	Paxton-Mitchell.
Safety valve	Consolidated.
Sanding devices	Viloco.
Sight-feed lubricators	Nathan.
Springs	Railway Steel Spring Co.
Staybolts	Tate.
Steam gages	Ashcroft.
Superheater	Schmidt.
Tires	Latrobe.
Tubes	Shelby.
Valve gear	Walschaert.

CAR BUILDING.

The *Pittsburgh & Lake Erie* is said to be in the market for 1,000 hopper and 1,000 gondola cars. This item has not been confirmed.

The *Atlantic Coast Line* has ordered 1,400 box cars from the American Car & Foundry Company, and 50 steel underframe phosphate cars from the Standard Steel Car Company.

The *Louisville & Nashville* has placed orders for 500 steel underframes for gondola cars, which are equally divided between the Mount Vernon Car and the American Car & Foundry companies.

The *Western Maryland* is said to have ordered 15 vestibule passenger, 2 combination, 2 baggage and 4 mail-and express cars from the Barney & Smith Car Company of Dayton, Ohio. This item has not been confirmed.

The *St. Louis & San Francisco*, reported in the *Railway Age Gazette* of March 17 as in the market for 11 postal cars, has ordered from the American Car & Foundry Company eleven 60-foot steel exterior and wood interior postal cars for the Kansas City, Ft. Scott & Memphis.

The *Ann Arbor Railroad*, as reported in the *Railway Age Gazette* of March 10, has ordered 50 refrigerator cars and 55 box cars from the Standard Steel Car Company. The refrigerator cars will have a capacity of 80,000 lbs. The inside measurements will be 39 ft. 1½ in. long, 8 ft. 4 in. wide and 7 ft. 7¾ in. high; the over-all measurements will be 40 ft. ¾ in. long, 9 ft. 2 in. wide and 13 ft. 1 in. high. The box cars will have a capacity of 80,000 lbs. The inside measurements will be 36 ft. long, 8 ft. 6 in. wide and 8 ft. high; the over-all measurements will be 37 ft. 5½ in. long, 9 ft. 2 in. wide and 13 ft. 8¾ in. high. The bodies of both types will be of wood and the underframes of steel. The special equipment on both types will be identical except where indicated.

Axles	Open hearth steel (Carnegie Steel Co.).
Bolsters, body	Steel.
Bolsters, truck	Am. Steel Foundries.
Brakes	New York Air Brake Co.
Couplers	Simplex (Am. Steel Foundries).
Draft gear	Farlow; Symington.
Insulating and lining.....	Keystone & Neptune (refrigerator).
Journal boxes	McCord.
Roofs	Hutchins—inside iron (box).
	Hutchins plastic (refrigerator).
Side bearings	Susemihl (Am. Steel Foundries).
Springs	Railway Steel Spring Co.
Trucks	Andrews steel side frames.
Wheels	Standard Steel Car Co.

The *Wabash-Pittsburg Terminal*, as reported in the *Railway Age Gazette* of March 10, has ordered 500 steel hopper cars from the Pressed Steel Car Company, and 500 steel hopper cars from the Standard Steel Car Company. The first 500 will be built at McKees Rocks, Pa., and the second 500 will be built at Butler, Pa. The capacity of all the cars will be 100,000 lbs., and they will weigh 37,000 lbs. Their inside measurements will be 30 ft. long, 9 ft. 5½ in. wide and 7 ft. ¼ in. high. Their over-all measurements will be 31 ft. 6 in. long, 10 ft. wide and 10 ft. 3 in. high. They will be all-steel self-clearing hopper cars. The specifications on both makes will be identical, except where indicated.

Axles	Open hearth steel (Carnegie Steel Co.).
Bolsters, body.....	Car Co.
Bolsters, truck.....	Simplex (Am. Steel Fdries.) on Standard Steel cars.
Bolsters, truck.....	Cast steel (Scullin-Gallagher) on Pressed Steel cars.
Brakes	Nestinghouse.
Brake beams.....	Waycott.
Brake shoes	American Brake Shoe & Foundry Co.
Brasses	Chimax Bearing Co.
Couplers	Am. Steel Foundries.
Doors	Carter dump.
Door fastenings.....	Enterprise Ry. Eq. Co.
Draft gear	Mirer tandem on Standard Steel cars.
Draft gear	T. H. Symington on Pressed Steel cars.
Journal boxes	Fort Pitt Mall. Iron Co. on Standard Steel cars.
Journal boxes	Included in truck frame on Pressed Steel cars.
Side bearings	Standard Car Truck Co.
Springs	Railway Steel-Spring Co.
Trucks	Am. Steel Fdries. on Standard Steel cars.
Trucks	Bette-dorf Axle Co. on Pressed Steel cars.
Wheels	Car Co.

Other Special Equipment.

Imperial uncoupling device.....	Andreon Mfg. Co.
Pyers wrought iron pipe and Dart unions throughout.	
Republic Rubber Co.'s air brake hose.	

IRON AND STEEL.

The *Queensland Government Railway* is in the market for 25,000 tons of rails.

The *Great Northern* has ordered 10,000 tons of rails from the Illinois Steel Company.

The *New Zealand Government Railway* is in the market for 10,000 tons of 70-lb. rails.

The *Chicago & Northwestern* has ordered 5,000 tons of rails in addition to the 40,000 tons mentioned in the *Railway Age Gazette* of February 24.

General Conditions in Steel.—Steel producers report a slight improvement in orders this week as compared with the corre-

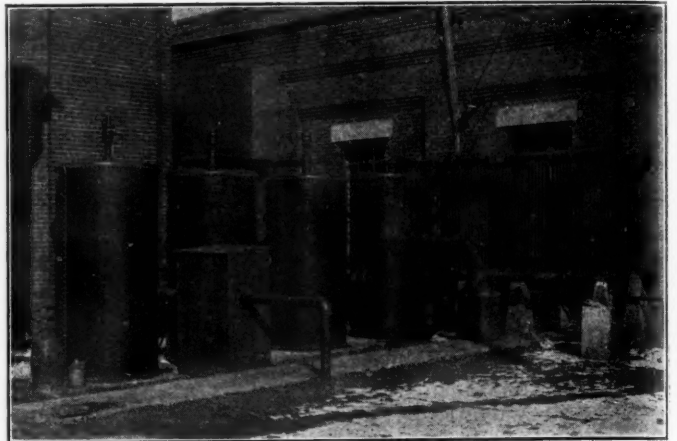
sponding period of last week. There has been a better business in structural steel and plates. The heavy steel mills are operating about 50 per cent. of their capacity, although the United States Steel Corporation expects to be operating about 75 per cent. of its blast furnace capacity by the end of the current month.

Power Plant for Passenger Car Yard.

The new power plant of the Lake Shore & Michigan Southern, at Root and State streets, Chicago, is a good illustration of the substantial work now done by railways in their shop, round-house and yard improvements. The plant is intended to supply compressed air, steam heat and light for the passenger car yard in which the coaches, Pullman cars, dinging cars, etc., which come into the La Salle street station are cleaned and repaired. The power house is 44 ft. x 52 ft., and the brick chimney is 175 ft. high. There is space in the boiler room for four 207 h. p. Babcock & Wilcox boilers, making a total capacity of 828 h. p., but as yet only three boilers, having a total capacity of 621 h. p., have been installed. The power equipment consists of one Ingersoll air compressor with a capacity of 1,200 cu. ft., one small turbine engine for lighting, one vacuum pump and one wash-out pump. On the outside are four large tanks used as reservoirs for the compressed air and a system of small pipe condensers for cooling it.

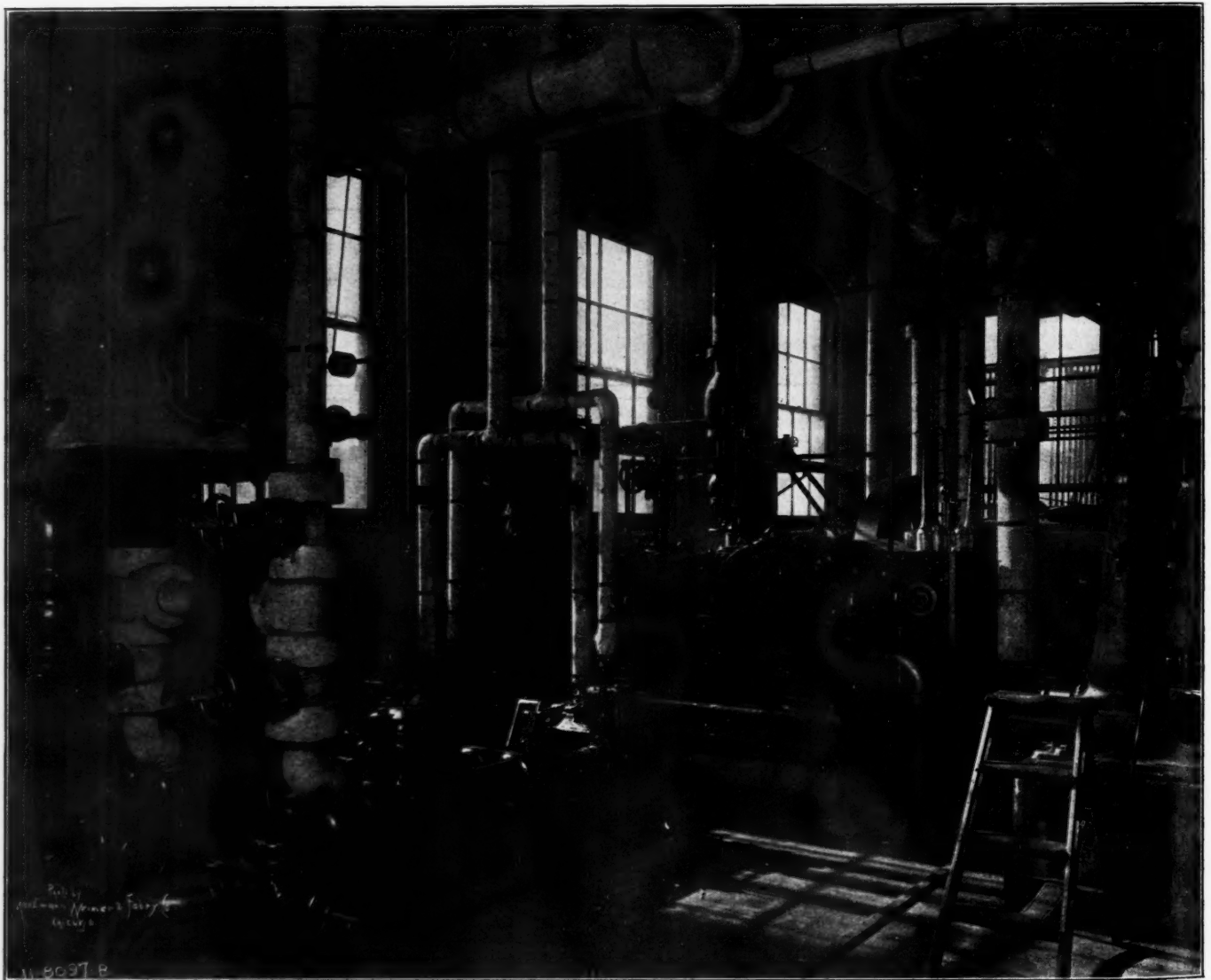
All the piping in the power house, and that connecting the air tanks outside, including the high-pressure steam lines, exhaust steam lines and the feed and compressed air lines, was installed by the Horace L. Winslow Company, Chicago. The boilers are fitted with automatic stop checks and emergency

valves. The main high pressure header is 8 ins. in diameter and is connected with curved connections, having a 5-ft. radius, to the automatic stop valves. These pipes are extra heavy and all valves and fittings over 2. ins. are flanged. The general design



Compressed Air Reservoirs and Coolers.

of the pipe work in this plant is of ample size, with full provision for expansion and contraction, and has ample area for the free flow of steam, air and water with minimum friction. Exceptionally strong hangers, clamps and anchors have been used, and, as a whole, it may be regarded as a good example of substantial and economical pipe installation.



Power Plant for Passenger Car Yard; Lake Shore & Michigan Southern.

ANNUAL REPORTS

FORTY-SECOND ANNUAL REPORT, NEW YORK CENTRAL AND HUDSON RIVER RAILROAD COMPANY: FOR THE YEAR ENDED DECEMBER 31, 1910.

To the Stockholders of

THE NEW YORK CENTRAL AND HUDSON RIVER RAILROAD COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1910, with statements showing the results for the year and the financial condition of the company.

The mileage embraced in the operation of the road is as follows:

	Miles.
Main line and branches owned.....	805.49
Proprietary lines	3.06
Lines leased*	2,621.11
Lines operated under contract.....	81.70
Trackage rights	273.67
Total road operated	3,785.03

The slight increase in road mileage operated is due to change of alignment and measurement at various points on the system and the extension of two branches of the Beech Creek Extension Railroad by 2.94 miles. A statement showing in detail miles of road and track operated will be found upon another page.

The capital stock authorized to December 31, 1910, is.....\$250,000,000.00

There was issued and outstanding on December 31, 1909.....\$178,632,000.00
There was issued during the year 1910.....44,097,300.00

the amount outstanding on December 31, 1910, being.....\$222,729,300.00
leaving a balance authorized but not issued of.....27,270,700.00

The funded debt outstanding on December 31, 1909, was.....\$249,914,845.00
There has been issued and sold during the year a part of the issue of gold debentures of 1904 amounting to.....5,000,000.00

making the total bonded debt outstanding on December 31, 1910.....\$254,914,845.00

There has also been placed upon the general books of the company its pro rata liability in connection with the certificates issued under the trust agreements, as follows:
Equipment trust certificates of 1907.....\$10,317,581.54
Less payment in the month of November.....793,660.12

Net amount outstanding December 31, 1910. \$9,523,921.42
Equipment trust certificates of 1910.....6,509,466.30 16,033,387.72

Mortgage on real estate in the city of New York.....150,000.00

bringing the total funded debt as shown on the balance sheet of December 31, 1910, to.....\$271,098,232.72

*The Dunkirk Allegheny Valley and Pittsburgh Railroad, 90.51 miles, is also leased by this company, but its mileage and operations are not included in this report. Separate accounts are kept and independent returns prepared in its behalf.

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME.

	1910.	1909.	Increase or decrease.
OPERATING INCOME.	3,785.03	3,781.83	3.20
RAIL OPERATIONS.	miles operated.	miles operated.	miles operated.
Revenues	\$99,908,478.17	\$93,171,860.69	\$6,736,617.48
Expenses	74,079,086.58	64,593,826.35	9,485,260.23
NET REVENUE FROM RAIL OPERATIONS	\$25,829,391.59	\$28,578,034.34	—\$2,748,642.75
Percentage of expenses to revenues	(74.15%)	(69.33%)	(4.82%)
OUTSIDE OPERATIONS.			
Revenues	\$4,791,030.30	\$4,517,996.90	\$273,033.40
Expenses	4,909,808.90	4,312,028.96	597,779.94
NET REVENUE FROM OUTSIDE OPERATIONS		\$205,967.94	
NET LOSS ON OUTSIDE OPERATIONS	\$118,778.60		—\$324,746.54
NET REVENUE FROM ALL OPERATIONS	\$25,710,612.99	\$28,784,002.28	—\$3,073,389.29
TAXES ACCRUED	4,697,826.30	4,434,504.32	263,321.98
OPERATING INCOME	\$21,012,786.69	\$24,349,497.96	—\$3,336,711.27
OTHER INCOME.			
Joint facilities rents.....	\$1,451,212.04	\$1,274,627.35	\$176,584.69
Miscellaneous rents	319,527.90	506,611.57	—187,083.67
Dividends on stocks owned or controlled	11,150,915.74	7,692,497.79	3,458,417.95
Interest on funded debt owned	573,754.67	577,901.13	—4,146.46
Interest on other securities, loans and accounts.....	1,595,601.41	1,080,595.14	515,006.27
Miscellaneous income	355,321.51	260,625.88	94,695.63
TOTAL OTHER INCOME.....	\$15,446,333.27	\$11,392,858.86	\$4,053,474.41
GROSS CORPORATE INCOME.....	\$36,459,119.96	\$35,742,356.82	\$716,763.14
DEDUCTIONS FROM GROSS CORPORATE INCOME.			
Rentals of leased lines.....	\$10,058,290.85	\$9,943,576.81	\$114,714.04
Hire of equipment	972,557.08	959,684.09	12,872.99
Joint facilities rents	538,131.73	449,441.42	88,690.31
Miscellaneous rents	504,395.88	83,057.29	421,338.59
Interest on funded debt.....	9,162,019.59	8,913,651.53	248,368.06
Interest on equipment trust certificates	630,097.20	548,948.26	81,148.94
Other interest	80,848.89	940,970.39	—860,121.50

	1910.	1909.	Increase or decrease.
St. L. & A. Railway: interest, rental, etc.	\$74,000.00	\$74,000.00	
N. Y. & Ottawa Railway: interest on bonds	58,240.00	58,240.00	
Other deductions	91,866.67	75,366.67	\$16,500.00
TOTAL DEDUCTIONS FROM GROSS CORPORATE INCOME	\$22,170,447.89	\$22,046,936.46	\$123,511.43
NET CORPORATE INCOME.....	\$14,288,672.07	\$13,695,420.36	\$593,251.71
DIVIDENDS, four each year*..	13,363,758.00	8,931,600.00	4,432,158.00
SURPLUS FOR THE YEAR....	\$924,914.07	\$4,763,820.36	—\$3,838,906.29
APPROPRIATIONS FOR ADDITIONS AND BETTERMENTS	924,914.07		924,914.07
BALANCE FOR YEAR CARRIED TO PROFIT AND LOSS.....		\$4,763,820.36	—\$4,763,820.36

NOTE: Decrease designated by minus sign, —.

*Dividend in 1910, 6% on 2,227,293 shares of stock; in 1909, 5% on 1,786,320 shares.

Balance to credit of profit and loss December 31, 1909..... \$15,409,187.67

Against this there has been charged:

Discount or loss on sundry securities.....	\$35,352.33
Uncollectible charges, sundry adjustments, etc. (net)	323,033.96
Commissions, discounts and expenses account of Equipment Trust of 1910.....	141,376.76
Abandoned property at various places.....	979,650.41
Cash payments and 1910 installments on account New York Central Lines Equipment Trusts transferred to appropriated surplus	1,592,157.84
	3,071,571.30

Balance December 31, 1910..... \$12,337,616.37

For the year covered by this report the revenue from transportation was \$98,685,744.75, an increase of \$6,447,221.47; revenue from operations other than transportation was \$1,222,733.42, an increase of \$289,396.01; revenue from outside operations (connected with, but in addition to transportation by rail) was \$4,791,030.30, an increase of \$273,033.40.

The total gross revenue from all operations was \$104,699,508.47, an increase of \$7,009,650.88. All sources of revenue from transportation have shown an increase with the exception of the mail service.

Freight revenue was \$58,411,234.14, an increase of \$3,961,952.67. The revenue freight carried amounted to 47,066,839 tons, an increase of 2,894,885 tons over last year, nearly reaching the tonnage of 1907 which still represents the highest level. Substantial increases show in all commodities with few exceptions, the largest increases occurring in coal and other minerals, metals and building material.

The revenue from passengers amounted to \$30,992,855.71, an increase of \$1,990,944.53. An increase in the number of local passengers carried of 1,317,999 and an increase of 967,489 in commutation passengers carried, with a slight increase in the average distance of travel and in the average receipts per mile, show that the passenger traffic over this company's lines continues in a satisfactory condition.

The revenue from express traffic was \$4,122,283.51, an increase of \$40,708.02 due to an enlarged volume of business. The expenses of rail operations amounted to \$74,079,086.58, an increase of \$9,485,260.23.

The operating expenses, by groups, were:

Maintenance of way and structures.....	\$14,060,177.83
Maintenance of equipment	16,936,253.24
Traffic expenses	2,487,227.74
Transportation expenses	37,938,526.75
General expenses	2,656,901.02
Outside operations	4,909,808.90

In maintenance of way and structures the cost has increased largely in every item due to a greater amount of work being necessary than in the previous year; 12,094 tons of new rails, most of them of the 80 lb. size, at an increased average cost, having been laid in excess of the total of the year 1909 and approximately 300,000 additional new ties placed; these two items accounting for \$578,072.29 of the increase. Signal and interlocking plants called for an outlay of \$503,165.24 larger than in 1909; buildings, fixtures and grounds an additional \$346,531.12, and repairs of bridges, trestles and culverts added \$204,617.58 to the total increase.

In maintenance of equipment an increase of \$1,514,605.03 is shown due mainly to a largely increased charge for repairs of steam locomotives and passenger cars. Traffic expenses, being those charges incurred in soliciting and procuring traffic outside of its actual movement by rail, amounted to \$2,487,227.74, an increase of \$213,400.06 mainly due to larger payments for outside agencies and expenses of fast freight lines.

To obtain the locomotives and cars necessary for immediate requirements, The New York Central & Hudson River Railroad Company, together with The Lake Shore & Michigan Southern Railway Company, The Michigan Central Railroad Company, The Cleveland Cincinnati Chicago & St. Louis Railway Company and the Chicago Indiana & Southern Railroad Company has become a party to an equipment trust agreement and lease dated January 1, 1910, known as the "New York Central Lines Equipment Trust of 1910." This agreement provides for an issue of \$30,000,000 of equipment trust certificates, bearing interest at 4½% per annum, being 90% of the total cost of the equipment to be furnished under the terms of said agreement. These certificates are to be paid off in fifteen annual installments of \$2,000,000 each, the first installment being payable January 1, 1911. The cost of the equipment to be leased under the terms of the agreement by this company will be \$7,232,740.33, and its pro rata liability for certificates representing 90% of the cost is \$6,509,466.30. Full particulars as to the character of the equipment acquired will be found upon another page.

The cost of transportation shows large increases in nearly all of the

accounts, the most noticeable being in fuel for locomotives, those engaged in yards being charged with \$176,481.65 more than in 1909, and those in general service on the road \$1,000,248.52 due to increased cost and to the greater amount of work performed, represented by an increase of 3,610,899 miles, each engine having averaged 1,486 more miles. The new rates of pay arranged in the early part of the year have been responsible for heavy increases in the cost of transportation. Enginemen have received \$817,569.48 and trainmen \$1,143,989.46 more than in the year 1909. Some of these increases are due to larger operations, indicated by the greater mileage of locomotives, an increase of 2,531,528 miles travelled by trains, and of 26,939,577 miles by cars, but the larger portion of them is caused by the increase in the rates of wages. The total increase in cost of transportation is \$4,629,211.93, nearly 14%.

General expenses show an increase of \$561,888.46, principally in the items of pensions and general office clerks and expenses. The increase in pensions is due to the development of the pension plan which was adopted on November 10, 1909, by which, effective January 1, 1910, employees who had reached seventy years of age, or were incapacitated for further work by reason of disabilities were, under certain restrictions, granted a life pension based on previous compensation and service, in lieu of the former rule of granting gratuities. The increase in the item of general office salaries and expenses was due to a great extent to the increasing exactions of the federal and state commissions, affecting the executive and accounting departments, together with the unusual number of elaborate and exhaustive studies, reports and data prepared during the year.

In outside operations a loss of \$118,778.60 is shown. Deficits of \$287,756.66 in harbor terminal transfers, \$209,093.82 in the operation of dining and special cars, and \$90,157.81 in ferry lines have been more than the profits from other outside operations could offset, although electric light and power plants, gas producing plants, grain elevators, stock yards, freight storage plants and the restaurant services have all produced fairly satisfactory profits.

Taxes have increased \$263,321.98, in which is included \$150,564.54 for the tax on the income of corporations levied by the Federal Government and paid by this company on behalf of itself and various leased lines.

In other income an increase of \$3,458,417.95 is shown in dividends on stocks owned or controlled; and an increase of \$515,006.27 in interest on other securities, loans and accounts. The increase in dividends is due principally to an extra dividend of six per cent. declared and paid by the Lake Shore and Michigan Southern Railway Company in March.

In deductions from gross corporate income rentals of leased lines increased \$114,714.04 due principally to the charge for interest on improvement bonds issued in 1910 by the Boston and Albany Railroad Company and a full year's interest on similar bonds issued in 1909.

Interest on bonds of this company shows an increase of \$248,368.06 due to the issue during 1910 of \$5,000,000 additional Gold debentures of 1904 and the payment of a full year's interest upon the Spuyten Duyvil and Port Morris Railroad mortgage bonds. Interest on equipment trust certificates increased \$81,148.94 due to the issue of certificates under the trust agreement of 1910. Other interest decreased \$860,121.50 due principally to the retirement of the three year gold notes of 1907.

The surplus for the year, after paying a dividend of \$13,363,758.00 representing six per cent. upon the capital stock, was \$924,914.07, which amount was appropriated for improvements made upon the property.

Extraordinary expenditures during the year were as follows:

For additions to property, other than equipment.....	\$4,960,177.90
For equipment, in excess of value of equipment retired....	6,272,537.62
For construction work on leased lines and for	
Grand Central terminal improvement.....	\$10,492,007.60
Less amount refunded from proceeds of	
securities of lessor companies.....	2,000,000.00
	8,492,007.60
	<u>\$19,724,723.12</u>

In addition to the above, there has been added to the property, under the head of trust equipment, \$16,873,001.65, to cover the value of the equipment delivered under the agreements of 1907 and 1910; the value of the remaining equipment, represented by outstanding certificates, is covered by a special deposit in the hands of the Guaranty Trust Company awaiting the delivery of the equipment, and appears in its proper place on the balance sheet.

Details of the above mentioned expenditures are shown on subsequent pages.

The operation of trains by electricity has been extended to Hastings on the Hudson River Division for trains equipped with the multiple unit system, and the extension of electric operation on the Harlem Division from Wakefield to North White Plains has been accomplished.

Satisfactory progress has been made in the work on the new Grand Central Terminal and increased facilities for the operation of trains have been provided.

The new office building on Lexington Avenue was occupied by the executive, financial and accounting departments early in the year and other departments followed as space was provided. The old Grand Central Station building was abandoned and is now almost entirely demolished. Work upon the street viaducts has been vigorously carried forward and this portion of the improvement is expected to be completed by the end of the year 1912. The new main station building is far advanced and the engineers in charge of the project estimate that it will be ready for use by the middle of the year 1912. The Merchants Loft Building, erected on a portion of the Terminal site as a joint investment of this company and the New York New Haven and Hartford Railroad Company, is nearing completion.

The company acquired in exchange for \$5,000,000 gold debentures of 1904 the entire issue of preferred stock of the Geneva Corning and Southern Railroad Company, amounting to \$5,000,000.

The Board of Directors has recorded the death of two of its active members and of two who had formerly been Directors.

Darius Ogden Mills, who was elected a member of the Board January 24, 1900, died on January 3, 1910.

Hamilton McKown Twombly, who was elected a member of the Board April 21, 1897, died on January 11, 1910.

Charles Cameron Clarke died on May 25, 1910. He entered the service of the Hudson River Railroad Company early in 1854 and was appointed Auditor on June 6 of that year, became Treasurer July 25, 1856, and on December 9, 1871, was appointed Treasurer of The New York Central and Hudson River Railroad Company. He was elected a Director May 4, 1883, and on the same day was appointed First Vice President. He resigned from the directorate January 27, 1909, and died at Briarcliffe Manor at the age of eighty-seven years. His life was a busy one, characterized by extraordinary energy and unswerving loyalty to the company during a period covering more than forty-five years.

Edward V. W. Rossiter, one of the oldest and most valued officers of the company, died December 11, 1910, and his loss was felt as a personal one by all who had been his associates or subordinates. He entered the service of the company as a boy of sixteen in the year 1860, became Cashier seven years later and Treasurer at the age of thirty-three. Able,

faithful, hard-working and patient, he influenced all who came in contact with him, and fully deserved the promotions which he received. During the last period of his life he was Vice President, in charge of the finances of this company and nine allied companies, and from April 15, 1903, to November 10, 1903, was a member of the Board of Directors.

The results of the operation of the property for the fiscal year have not been as favorable as, at the beginning of the year, it was expected they would be.

Early in the year demands were made by employees in train, engine and yard service on the Baltimore and Ohio Railroad for an increase in pay. After prolonged negotiations, in order to avoid a strike, the question was, under the provisions of the Erdman Act, referred to the Chairman of the Interstate Commerce Commission and the Commissioner of Labor. The result substantially increased the wage scale of the employees involved. Reference is here made to this decision because it formed a basis for demands upon all other carriers in eastern territory.

Our employees in train and yard service immediately presented demands for the adoption of the Baltimore and Ohio schedule of pay. Conferences were held and every possible effort exerted to avoid making any increases. These conferences finally resulted in a deadlock, the organizations insisting on their full demands which the management felt could not be conceded.

A vote of employees was taken, resulting almost unanimously in favor of a strike. A further conference was then had and arbitration under the Erdman Act suggested, which was declined by the employees. It was then suggested that the matter be left to the New York Public Service Commission and this suggestion was also declined.

Finally, in order to avoid a strike, which would have been disastrous to the railroads, the employees and the communities served by our lines, an offer was made to submit the matter to Mr. E. E. Clark, a member of the Interstate Commerce Commission and formerly Grand Chief of the Order of Railway Conductors, and Mr. P. H. Morrissey, formerly President of the Brotherhood of Railroad Trainmen. After twenty-four hours' deliberation the proposition was accepted.

By this arbitration an increase of about \$3,600,000 per annum in wages of employees was made and changed conditions of service included in the finding very materially increased this amount.

Similar increases were demanded and, by similar arbitration, enforced, on substantially all the lines between Chicago and the Atlantic seaboard.

After carefully measuring the effect of this increased cost of operation, it was felt that an increase in revenue must be provided, which could best be accomplished by an increase in class rates and certain commodity rates, on which little or no increase had been made in something like thirty years, during which time wages and the cost of materials used in railroad service had greatly increased. Tariffs were filed with the Interstate Commerce Commission on May 31, 1910, which would, under existing law, have become effective thirty days thereafter. A bill had been introduced in Congress very largely increasing the authority of the commission, including, among other things, the right to suspend the taking effect of any proposed increase in rates for a period not exceeding ten months, and it was feared that the filing of the tariffs might be construed as an effort to evade the provision of the proposed law. This company, therefore, in conjunction with other roads in interest, announced through the press, and subsequently advised the President of the United States and the Interstate Commerce Commission, that the rates filed would be subject to the provisions of any amendment to the Interstate Commerce Law that might be passed and that the commission could fix the date on which the increased rates should become effective.

Under this arrangement, successive suspensions of the proposed increases were made by the commission, the last one on January 30 to March 15, 1911.

On February 22, while this report was being compiled, the case was decided by the commission, denying all increases asked for, requiring the withdrawal of the proposed tariffs on or before March 10, 1911, and giving notice that if they were not so withdrawn, an order would be issued directing the maintenance of the present rates for a period of two years from that date.

The amendment to the Interstate Commerce Act above referred to, which was introduced and became effective after the filing of the tariffs, contained a provision that:

"At any hearing involving a rate increased after January 1, 1910, or of a rate sought to be increased after the passage of this act, the burden of proof to show that the increased rate or proposed increased rate is just and reasonable shall be upon the common carrier."

The increased expenses became effective April 1; the public hearings on the applications for increased rates began during the summer, and were concluded in November.

In deciding the case in the territory east of Chicago, the commission said in part: "Upon a view of the whole situation we hold that these defendants have not established such a need for additional revenue as justified, at this time, an increase in these rates."

"It has been several times stated in the course of this discussion, and should be repeated here, that in view of the complex character of this problem, nothing but an actual test can satisfactorily determine the financial results from the operations of these several carriers. There is no evidence before us which establishes the necessity for higher rates. The probability is that increased rates will not be necessary in the future. In view of the liberal returns received by these defendants in the past ten years, they should be required to show, with reasonable certainty, the necessity before the increase is allowed."

The earnings of the fiscal year ended June 30, 1910, were the largest in the history of the carriers in Official Classification Territory, reflecting the rebound from the depression of 1908-09, coupled with a full, normal crop of agricultural products; while the year previous, with which comparison was frequently made, showed the smallest gross earnings of any year in the five-year period, 1906 to 1910, inclusive. Furthermore, the fiscal year ended June 30, 1910, included but three months of the augmented expense of operation caused by the increase in wages, and the carriers felt that it could not be regarded as a normal year, or be accepted as a safe basis for judging the probable results of future operations upon the higher basis of expenses.

In presenting the case to the commission, the evidence adduced by the carriers, of necessity, consisted largely of expressions of opinion and estimates based upon the best judgment and experience of the witness. Under these circumstances, success was doubtful. Under the test exacted by the commission that "nothing but an actual test can satisfactorily determine the financial results from the operation of these several carriers," it was impossible, because the time available between the filing of the proposed tariffs and the decision of the case did not admit of the application of that test.

To apply a rule of this character to every appeal for relief on the part of the carriers might involve great injustice and it should be stated that the language of the decision indicates that it applies only to this particular case. The decision is qualified as follows:

"If actual results should determine that our forecast of the future is wrong, there might be grounds for asking a further consideration of the subject."

"But it should be further said that, before any general advance can be permitted, it must appear with reasonable certainty that carriers have exercised proper economy in the purchase of their supplies, in the payment of their wages and in the general conduct of their business."

This assurance of the commission of its willingness to give further consideration to this subject, if results shall demonstrate that the forecast upon which the decision is based was mistaken, is eminently fair, and no exception can be taken to the conditions imposed that the carriers must show that proper economy in the payment of wages, purchase of supplies, etc., is exercised. In this connection, however, it is due the management that the shareholders be advised that over the one item of wages, representing from sixty-three to sixty-five per cent. of the total operating expense, the railroads have been by statute deprived of very substantial control.

Under the Erdman Act passed by Congress in June, 1898, it is provided among other things:

"That whenever a controversy concerning wages, hours of labor or conditions of employment shall arise between a carrier subject to this act and the employees of such carrier, seriously interrupting or threatening to interrupt the business of said carrier, the Chairman of the Interstate Commerce Commission and the Commissioner of Labor shall, upon the request of either party to the controversy, with all practicable expedition, put themselves in communication with the parties to such controversy, and shall use their best efforts, by mediation and conciliation, to amicably settle the same, and if such efforts shall be unsuccessful, shall at once endeavor to bring about an arbitration of such controversy in accordance with the provisions of this act."

The act provides that one arbitrator shall be named by the carrier or employer, another by the labor organization to which the employees directly interested belong; the two thus chosen to name the third, and in the event of a failure to so name a third arbitrator, then the Chairman of the Interstate Commerce Commission and the Commissioner of Labor shall make the selection. Arbitration almost invariably means compromise, and this is especially true where labor is involved on one hand and an employing corporation on the other.

Labor is so thoroughly organized that a strike on one system would very rapidly spread to all roads in common territory, and the effect of such a struggle would be so wide-spread and so disastrous that no railroad would, even with the most ample justification, undertake it except as a last resort. With the aid of public opinion, inspired by a statement from the Chairman of the Interstate Commerce Commission and the Commissioner of Labor, that in their opinion a demand for an increase in wages was not justified, a railroad might enter upon a contest of this kind with hope for a favorable result; without this support, the struggle would be well nigh hopeless.

Without entering upon a discussion of the fairness of the general basis of wages paid employees of the carriers, it may be said that the present level is largely the result of successive mediations and arbitrations under the Erdman Act, and is higher than can, in the judgment of railroad managers of long experience, be continued by many of the roads upon the present basis of freight and passenger rates in the territory east of Chicago.

Increased cost of living, the rising cost of commodities of almost all kinds, has been a compelling argument in favor of advancing wages. In recognizing these conditions as affecting the employee, it is not unreasonable to hope the commission will realize that the same conditions apply to the employer, and that increases to the former made effective by mediation or arbitration involve some measure of responsibility for the effect of such increase upon the ability to pay, of the latter.

In regard to the purchase of the millions of dollars worth of supplies and materials bought by the railroads annually, while absolute honesty and the highest commercial ability may not be found in every transaction, it is doubtful if, taken as a whole, any other business of like magnitude will show a cleaner record.

Fuel represents nearly one-third of the cost of all material used by the railroads, and investigation will show that the railroads buy coal at a substantially lower price than almost any other large consumer; as a rule, at a price that leaves an exceedingly slender margin above cost.

Fuel, rail, ties, lumber, locomotives, cars and other large items in the list of material and supplies, are purchased very largely on contracts, which are open to the inspection of agents and inspectors of the Interstate Commerce Commission, who have as full access to the books and records of the railroads as National Bank examiners have to those of the national banks. In any investigation which the commission may find

necessary or desirable, the responsible officers of the railroad in any department may be required to submit, under oath, to the most rigid examination.

Under these circumstances, substantially exact knowledge is possible, and any doubt that may exist in the minds of the commission may be confirmed or dissipated by such an investigation.

Pursuant to the suggestion of the commission, the advanced tariffs have been withdrawn.

The decision has been accepted in good faith, and every method of economy that can be enforced without resulting in deterioration of the property or impairment of the efficiency of the service is being adopted.

In March, 1910, it was the judgment of your Board of Directors that the financial results of the year ended December 31, 1909, and the outlook for the ensuing year, justified increasing the rate of dividend on the capital stock of the company from five to six per cent. per annum.

As a first measure of retrenchment, at a meeting of the Board held on March 8, 1911, the dividend was reduced to a five per cent. basis.

If the forecast of the Interstate Commerce Commission that increased volume of business and such economies as can wisely be adopted will offset the large increase in cost of operation is realized, then the railroads will very gladly acknowledge that they were mistaken in their apprehensions.

On the other hand, if the results of operation, as they shall be developed month by month, demonstrate that those apprehensions were not entirely groundless, further appeal will, in due time, be made to the commission with full confidence that needed relief will be granted.

The management is under renewed obligations to the Public Service Commissions of the State of New York and to the Massachusetts Board of Railroad Commissioners for helpful co-operation in improving the service and in fostering cordial relations between the road and its patrons.

The following appointments were made during the year: February 1, Richard A. White, General Auditor; July 15, William K. Vanderbilt, Jr., Assistant to the President; September 1, Loren F. Vosburgh, General Passenger Agent.

Appreciative acknowledgment is made of the faithful, efficient performance of duty by employees in every department of the service during the year.

WILLIAM C. BROWN,
President.

CONDENSED GENERAL BALANCE SHEET, DECEMBER 31, 1910.

Assets.	
Property owned as investment:	
Physical property owned.....	\$255,315,444.49
Securities owned	131,557,710.90
Other permanent investments	49,674,553.05
Total property owned as investment.....	\$436,547,708.44
Working assets:	
Cash	\$6,777,901.21
Treasury stock	300.00
Marketable securities	27,681,683.42
Loans and bills receivable.....	24,724,471.58
Net traffic, car mileage and per diem balance	3,226,409.78
Net balance due from agents and conductors	3,439,085.49
Miscellaneous accounts receivable.....	8,171,738.05
Materials and supplies	9,144,817.29
	83,166,406.82
Deferred debit items	22,522,028.75
Total assets	\$542,236,144.01
Liabilities.	
Stock:	
Capital stock, common.....	\$222,724,400.00
Consolidation certificates	4,900.00
	\$222,729,300.00
Mortgage, bonded and secured debt.....	271,098,232.72
Working liabilities	23,098,687.42
Accrued liabilities not due	8,111,805.95
Deferred credit items	3,134.56
Additions to property through income since June 30, 1907..	4,857,366.99
Profit and loss: Surplus	12,337,616.37
Total liabilities	\$542,236,144.01

FORTY-FIRST ANNUAL REPORT, LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY COMPANY: FOR THE YEAR ENDED DECEMBER 31, 1910.

To the Stockholders of

THE LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY COMPANY:

The Board of Directors herewith submits its report for the year ended December 31st, 1910, with statements showing the results for the year and the financial condition of the company.

The mileage embraced in the operation of the road is as follows:

	Miles.
Main line and branches	871.03
Proprietary lines	289.32
Leased lines	414.73
Trackage rights	87.83
Total road operated	1,662.91

A statement, showing in detail the miles of road and track operated, will be found upon another page.

There was no change in capital stock during the year, the amount authorized and outstanding December 31st, 1910, being \$50,000,000.00.

The funded debt outstanding on December 31st, 1909, was.. \$150,400,000.00

It has been increased during the year by the issue and sale of twenty-five year, four per cent. gold bonds of 1906, out of a remaining unissued balance of \$15,000,000.00..... \$9,280,000.00

There has also been placed upon the general books of the company, its pro-rata liability in connection with the certificates issued under the New York Central Lines equipment trust agreements of 1907 and 1910..... 19,585,005.97 28,865,005.97

Total \$179,265,005.97

It has been decreased during the year by the retirement of three year five per cent. gold notes issued by the company February 1st, 1907, aggregating\$15,000,000.00

Also by the payment on November 1st, of the company's pro-rata of the third installment on the equipment trust certificates of 1907.

\$447,226.18 \$15,447,226.18

Total funded debt December 31st, 1910.. \$163,817,779.79

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME.

	1910.	1909.	Increase or decrease.
OPERATING INCOME.	1,662.91	1,662.79	.12
RAIL OPERATIONS.	miles operated.	miles operated.	miles operated.
Revenues	\$49,420,210.99	\$45,110,997.15	\$4,309,213.84
Expenses	34,920,932.90	28,023,661.04	6,897,271.86
NET REVENUE FROM RAIL OPERATIONS	\$14,499,278.09	\$17,087,336.11	—\$2,588,058.02
Percentage of expenses to revenues	(70.66%)	(62.12%)	(8.54%)
OUTSIDE OPERATIONS.			
Revenues	\$559,376.73	\$422,399.56	\$136,977.17
Expenses	609,092.28	501,306.73	107,785.55
NET DEFICIT FROM OUTSIDE OPERATIONS	\$49,715.55	\$78,907.17	—\$29,191.62
NET REVENUE FROM ALL OPERATIONS	\$14,449,562.54	\$17,008,428.94	—\$2,558,866.40
TAXES ACCRUED	1,720,182.33	1,458,905.00	261,277.33
OPERATING INCOME	\$12,729,380.21	\$15,549,523.94	—\$2,820,143.73
OTHER INCOME.			
Hire of equipment	\$383,818.19	*\$272,621.06	\$656,439.25
Joint facilities rents	350,446.54	381,596.15	—31,149.61
Miscellaneous rents	70,209.43	43,070.37	27,139.06
*Debit.			

OTHER INCOME. (Continued)	1910.	1909.	Increase or decrease.
Dividends on stocks owned or controlled	\$7,755,013.50	\$4,550,205.62	\$3,204,807.88
Interest on funded debt owned	164,946.87	231,310.00	—66,363.13
Interest on other securities, loans and accounts	1,005,914.11	1,268,721.45	—262,807.34
Miscellaneous income	721,738.05	11,983.69	709,754.36
TOTAL OTHER INCOME.....	\$10,452,086.69	\$6,214,266.22	\$4,237,820.47
GROSS CORPORATE INCOME.....	\$23,181,466.90	\$21,763,790.16	\$1,417,676.74
DEDUCTIONS FROM GROSS CORPORATE INCOME.			
Rentals of leased lines.....	\$2,268,573.56	\$1,858,691.23	\$409,882.33
Joint facilities rents.....	336,967.91	277,237.45	59,730.36
Miscellaneous rents	8,122.88	5,051.46	3,071.42
Interest on bonded debt.....	5,454,783.05	5,920,000.00	—465,216.95
Interest on equipment trust certificates	542,595.54	309,331.46	233,264.08
Other interest	410,222.83	75,181.93	335,040.90
Dividend on guaranteed stock	96,030.00	64,020.00	32,010.00
Other deductions	277,135.80	336,728.52	—59,592.72
TOTAL DEDUCTIONS FROM GROSS CORPORATE INCOME	\$9,394,431.47	\$8,846,242.05	\$548,189.42
NET CORPORATE INCOME.....	\$13,787,035.43	\$12,917,548.11	\$869,487.32
DIVIDENDS (18% 1910, 12% 1909)	\$8,903,970.00	\$5,935,980.00	\$2,967,990.00
SURPLUS FOR THE YEAR.....	\$4,883,065.43	\$6,981,568.11	—\$2,098,502.68
Additional equipment		1,263,186.28	—1,263,186.28
1910 installments on 1907 and 1910 trust equipment.....	1,365,297.22		1,365,297.22
BALANCE TO CREDIT OF PROFIT AND LOSS	\$3,517,768.21	\$5,718,381.83	—\$2,200,613.62

NOTE: Decrease designated by minus sign —.

Balance to credit of profit and loss for the year 1910.....	\$3,517,768.21
Amount to credit of profit and loss, December 31, 1909.....	27,166,038.10
	\$30,683,806.31

Add:

Profit from sale of Jamestown, Franklin and Clearfield Railroad Company bonds.....	\$1,430,000.00
Profit from sale of Hocking Valley Railway Company stock	177,300.00
	1,607,300.00
	\$32,291,106.31

Deduct:

Discount on \$9,280,000.00 gold bonds of 1906.....	\$741,321.25
Discount, commission and expenses on account of New York Central Lines equipment trust certificates of 1910	299,565.71
Commission and expenses on one year franc notes	11,920.40
Initial payment of ten per cent. on New York Central Lines equipment trust of 1910, credited to appropriated surplus.....	1,481,957.25
Net loss in adjustment of sundry accounts.....	35,122.65
	2,569,887.26

Balance to credit of profit and loss, December 31, 1910	\$29,721,219.05
---------------------------------------------------------------	------------------------

The operating revenues for the year were \$49,420,210.99, an increase of \$4,309,213.84 as compared with the previous year. Revenue derived from transportation of freight amounted to \$32,646,535.52, an increase of \$2,911,258.90, due to the greater tonnage handled; the principal increases being in bituminous coal, ores, other mineral and manufactured products. Passenger revenue was \$11,130,124.78, an increase of \$975,904.61, due to a larger number of both interline and local passengers carried. The revenue from transportation of mails was \$2,124,214.11, an increase of \$27.41. Revenue from express traffic was \$1,649,342.83, an increase of \$147,320.75. Other passenger train revenue, including excess baggage and milk, amounted to \$689,425.30, an increase of \$51,501.09. Switching and other transportation revenue amounted to \$679,648.33, an increase of \$75,466.34, due principally to larger receipts from switching service. Other than transportation revenues were \$500,920.12, an increase of \$147,734.74, due mainly to larger collections of car demurrage and additional revenue derived from the rental of buildings and other property. Operating expenses for the year amounted to \$34,920,932.90, an increase of \$6,897,271.86. Operating expenses and increases therein by groups were:

	Increase.
Maintenance of way and structures	\$7,549,661.40
Maintenance of equipment.....	7,873,217.06
Traffic expenses	1,153,165.10
Transportation expenses	17,442,857.80
General expenses	902,031.54
	174,837.79

In maintenance of way and structures there were included large expenditures for ballasting 315 miles of main line track with stone, changing traffic from left-hand to right-hand running and general repairs and renewals of bridge structures, buildings and fixtures. There was also a large increase in maintenance of roadway and track expenses due to additional main track built and resulting greater mileage of main tracks to maintain. Maintenance of way employees were granted an increase in wages in the early part of the year, which added \$297,761.00 to maintenance expenses.

Increases in maintenance of equipment expenses during the year were largely attributable to the following causes: advances in rates of pay granted to shopmen, aggregating \$151,979.47; higher prices paid for materials purchased, representing an increased cost of \$203,700.00; heavy charges in repairs due to equipping a large number of locomotives with improved devices, such as stokers, superheaters, etc. The remaining increases are principally due to additional mileage of equipment in service during the year.

Increased traffic expenses were principally due to large expense in printing tariffs.

Transportation expenses show an increase in all items affected by the movement of traffic, which is partially attributed to the substantial gain in freight and passenger business. Demands made upon the company by switchmen and trainmen for an increase in wages were submitted to arbitration and were followed by a general arbitration affecting the wages of practically all employees of the transportation department, resulting in increased wages to engineers, conductors and other trainmen, yardmen, station forces and telegraph operators, creating an additional charge to transportation expenses within the year, through said increased rates of pay, of \$644,467.27. The strike of bituminous coal miners in the Illinois fields during the greater part of the year forced the company to obtain fuel coal from other fields at a considerably advanced cost, which partially explains the large increase in the fuel for locomotive items.

In general expenses are included the payments made by the company during the year to aged and disabled employees who have been retired under the pension plan effective January 1, 1910, and the payment of a large premium due to placing fire insurance on practically all of the company's buildings and passenger equipment, effective January 1, 1910, it having been the policy in prior years to insure only a very small portion of the company's property.

Outside operations show a decreased loss for the year of \$29,191.62, principally due to the company's commercial ice supply plants having been operated at a gain through the reduced price at which ice was obtained. Taxes accrued amounted to \$1,720,182.33, an increase of \$261,277.33. Of this amount \$137,739.75 is due to the income tax of one per cent. imposed by the federal government, the balance being distributed to all states in which the company operates.

Other income for the year was \$10,452,086.69, an increase of \$4,237,820.47 as compared with the previous year, due to additional amounts received by the company for use of its equipment on foreign lines, larger revenue received from dividends on stock owned and increase in miscellaneous income.

Deductions from gross corporate income were \$9,394,431.47, an increase of \$548,189.42 as compared with the previous year. This is attributable to the following causes:

Rental of Jamestown, Franklin and Clearfield Railroad increased \$209,062.71, due to payment of interest for the full year on \$11,000,000.00 bonds issued by that company as compared with a half year's interest paid in 1909 and rental of the Mahoning Coal Railroad increased \$200,819.62, due to the larger volume of traffic handled over that road, a total increase of \$409,882.33 in rental of leased lines.

Joint facilities and miscellaneous rents increased \$62,801.78. Interest on equipment trust certificates increased \$233,264.08, through the participation of the company in the trust certificates of 1910 issued during the year.

Other interest increased \$335,040.90, principally attributable to interest accrued on one year franc notes issued by the company March 17, 1910.

Interest on bonded debt decreased \$465,216.95, largely due to the retirement of three year gold notes.

Other deductions decreased \$59,592.72, due to reduction of the company's proportion of deficit of Indiana Harbor Belt Railroad Company.

From the net corporate income of the company for the year, of \$13,787,035.43, three dividends, aggregating 18 per cent. amounting to \$8,903,970.00, were paid, leaving a surplus for the year of \$4,883,065.43, from which there was deducted installments for the year 1909, on trust equipment certificates of 1907 and 1910, amounting to \$1,365,297.22. In 1909, the sum of \$1,263,186.28 was deducted from income for additional equipment.

The work of changing the main line between Buffalo and Chicago, from left to right hand running, which commenced in 1909, was completed on December 27th, 1910, at a total expense to the company of approximately \$1,150,000.00.

The company issued as of March 17, 1910, its notes payable March 15, 1911, to the extent of 44,000,000 francs, equivalent to \$8,502,415.46.

To obtain the locomotives and cars necessary for immediate requirements, The Lake Shore and Michigan Southern Railway Company, together with The New York Central and Hudson River Railroad Company, The Michigan Central Railroad Company, The Cleveland, Cincinnati, Chicago and St. Louis Railway Company, and the Chicago, Indiana and Southern Railroad Company, has become a party to an equipment trust agreement and lease dated January 1, 1910, known as "New York Central Lines Equipment Trust of 1910." This agreement provides for an issue of \$30,000,000 of equipment trust certificates, bearing interest at four and a half per cent. per annum, being ninety per cent. of the total cost of the equipment to be furnished under the terms of said agreement. These certificates are to be paid off in fifteen annual installments of \$2,000,000 each, the first installment being payable January 1, 1911. The cost of the equipment to be leased under the terms of the agreement by this company, will be \$15,301,184.00, and its pro-rata liability for certificates representing ninety per cent. of the cost is \$13,771,065.60. Full particulars as to the character of the equipment acquired will be found upon another page.

During the year the company acquired by purchase 40,271 shares of stock of the Kanawha and Michigan Railway Company, 60,001 share of stock of the Pittsburgh and Lake Erie Railroad Company, all of the outstanding capital stock of the Toledo and Ohio Central Railway Company, being 37,014 shares of preferred stock and 58,463 shares of common stock, and \$80,000.00 of Toledo and Ohio Central Railway Company, St. Mary's Division, first preference income bonds.

The company sold during the year 11,540 shares of stock of the Hocking Valley Railway Company and \$11,000,000.00 of Jamestown, Franklin and Clearfield Railroad Company first mortgage bonds.

Cost of road and equipment on December 31, 1909, was... \$101,322,482.58

It has been increased during the year as follows:

Expenditures for additions and betterments to the property as shown in detail elsewhere	\$6,371,015.98
To show upon the company's books the cost of the equipment acquired under the New York Central Lines' Equipment Trusts of 1907 and 1910, viz.:	
Equipment trust of 1907.....	5,739,402.67
Equipment trust of 1910.....	14,766,060.11
	26,876,478.76
	\$128,198,961.34

Amount credited to equipment replacement fund	\$1,373,738.59
To which fund there was charged the cost of additional equipment acquired consisting of 2 locomotives, 2 steel buffet cars, 132 caboose cars, 3 snow plows, 1 wrecking crane, 2 steam shovels and other miscellaneous equipment	386,914.08
	986,824.51

Cost of road and equipment, December 31, 1910 **\$127,212,136.83**

The Board records the death, on January 3, 1910, of Mr. Darius O. Mills, and on January 11, 1910, of Mr. Hamilton McK. Twombly, both directors of the company.

To fill these vacancies Messrs. James Stillman and Marvin Hughitt were elected directors.

The Board also records the death, on December 11, 1910, of Mr. Edward V. W. Rossiter, who had been a vice-president of the company since July 1, 1904.

The following appointments were made during the year:

January 1, Richard M. Huddleston, General Auditor; George M. Glazier, Auditor; Leroy V. Porter, Assistant Auditor; William A. Terry and James Webster, Assistant Freight Traffic Managers.
January 5, Frank H. Wilson, Assistant General Superintendent.
January 15, Wallace W. Ryder, General Superintendent of Telegraph.
February 1, John W. Daly, Assistant Passenger Traffic Manager, and Lester A. Robinson, General Passenger Agent.
April 18, Herbert J. Merrick, General Superintendent Freight Transportation, and Orin C. Smith, Superintendent Car Service.
May 16, Donald R. MacBain, Superintendent Motive Power.
June 1, Roscoe B. Kendig, General Mechanical Engineer.
July 15, William K. Vanderbilt, Jr., Assistant to President, and Samuel H. West, Assistant General Attorney, Cleveland district.
October 1, Edgar Freeman, Assistant Treasurer.
October 31, Joseph F. Farrell, General Tie Agent.

Appreciative acknowledgment is made of the faithful, efficient performance of duty by employees in every department of the service during the year.

WILLIAM C. BROWN,
President.

CONDENSED GENERAL BALANCE SHEET, DECEMBER 31, 1910.

Assets.	
Property investment	\$134,380,847.20
Working assets:	
Cash	\$4,290,339.07
Securities issued or assumed—held in treasury:	
Lake Shore and Michigan Southern Ry.	
Co. stock	6,741.50
Marketable securities	97,632,374.05
Loans and bills receivable	6,627,000.17
Traffic and car service balances due from other companies	2,663,283.04
Net balance due from agents and conductors	971,022.23
Miscellaneous accounts receivable	6,823,730.23
Materials and supplies	4,250,202.82
Other working assets	184,644.74
123,449,337.85	
Accrued income not due:	
Unmatured interest, dividends and rents receivable	1,049,689.52
Deferred debit items	15,055,117.22
Total assets	\$273,934,991.79
Liabilities.	
Stock	\$50,000,000.00
Mortgage, bonded and secured debt	163,817,779.79
Working liabilities	17,014,928.02
Accrued liabilities not due	4,171,607.49
Deferred credit items	364,134.39
Additions to property	8,845,323.05
Profit and loss	29,721,219.05
Total liabilities	\$273,934,991.79

TWENTY-SECOND ANNUAL REPORT, CLEVELAND, CINCINNATI, CHICAGO AND ST. LOUIS RAILWAY COMPANY: FOR THE YEAR ENDED DECEMBER 31, 1910.

To the stockholders of

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY COMPANY:
The Board of Directors herewith submits its report for the year ended December 31, 1910.

The mileage embraced in the operation of the road is as follows:

Main line	1,680.95
Branches	166.64
Trackage rights	134.62
Total length of road operated	1,982.21
Second track	378.10
Side tracks	1,074.94
Total mileage of track	3,435.25

The total mileage of track operated has been increased during the year as follows:

Second tracks: increased	39.47
Side tracks: decreased	9.33
Total additional tracks	30.14

A statement showing in detail the mileage of road operated will be found on another page.

The following is a statement of the capital stock authorized and outstanding on December 31, 1910:

Preferred stock authorized	\$10,000,000.00
Common stock authorized	50,000,000.00
Total preferred and common stock authorized	\$60,000,000.00
Preferred stock issued and outstanding	\$10,000,000.00
Common stock issued and outstanding	47,056,300.00
Balance common stock authorized but not issued, December 31, 1910	\$2,943,700.00
The funded debt outstanding December 31, 1909, was	\$70,187,155.00

It has been increased during the year as follows:

C C C & St. L Ry general mortgage bonds; issued for additions, improvements, double tracking, equipment, etc.	\$1,000,000.00
C C C & St. L Ry 4% twenty-year debenture bonds, dated June 1, 1910, maturing June 1, 1930, issued for purpose of funding floating indebtedness, and for construction and improvements to an aggregate amount of 50,000,000 francs, equivalent at date of issue to	9,650,180.94
C C C & St. L Ry general mortgage bonds issued for retirement of prior lien bonds	78,000.00
There has also been placed upon the general books of the Company its pro rata liability in connection with the certificates issued under the New York Central Lines Equipment Trust Agreements of 1907 and 1910	6,201,354.84
	16,929,535.78
	\$87,116,690.78

Prior lien bonds and equipment trust certificates retired during the year:

Equipment trust certificates due November 1, 1910	\$246,689.81
C I St L & C Ry Co first mortgage bonds	6,000.00
C I St L & C Ry Co general first mortgage bonds	72,000.00
324,689.81	
Total funded debt outstanding December 31, 1910	\$86,792,000.97

There was expended during the year for additions to the property, improvements, double tracking, equipment, etc., and charged to cost of road and equipment, the sum of \$9,217,391.17, as follows:

Cleveland Division	\$1,304,012.54
Cincinnati Division	879,560.25

St. Louis Division	\$318,673.28
Chicago Division	629,269.56
Cairo Division	540,025.15
Michigan Division	27,617.56
Interest and commission	264,669.39
For new equipment	5,253,563.44
Total	\$9,217,391.17

A detailed statement of the above will be found upon another page.

During the year there was advanced for construction of the Evansville, Mt. Carmel and Northern Railway, \$1,341,931.50. This company was incorporated under the laws of the State of Indiana, and articles of association filed August 1, 1906, for the purpose of constructing a railroad from Evansville, Indiana, to the Illinois State Line, near Mt. Carmel. November 7, 1906, articles of association were also filed in the State of Illinois, for the incorporation of a railroad company named the Evansville, Mt. Carmel and Northern Railway Company, for the purpose of constructing a railroad from Mt. Carmel to the Indiana State Line, intersecting the railway of the Indiana company. On October 17, 1910, the Company so incorporated in Indiana acquired, by purchase, the property rights and franchises of said Company of Illinois. On November 1, 1910, the Indiana company entered into an agreement with the C. C. C. & St. L. Ry. Co., under which the latter is to operate the line of the former. It is expected that the road will be opened for traffic on June 1, 1911.

The Saline Valley Railway Company was organized under the laws of the State of Illinois, April 6, 1907, for the purpose of constructing a railroad from Harrisburg, Saline County, Illinois, to Marion, Williamson County, Illinois. There has been advanced on account of this property, during the year, \$20,068.95.

There has been advanced on account of the St. Louis Short Line Division for construction during the year, \$12,702.42.

This company's proportion of the deficit in operation of the Central Indiana Railway for the year 1910, amounting to \$62,465.00, has been charged of as a "Deduction from Income."

There have been purchased during the year by the Central Trust Company, Trustee for the sinking fund of the C. C. C. & St. L. Ry. Company's St. Louis Division first collateral trust bonds, 24 bonds, par value \$24,000.00, making a total of 566 bonds at par value of \$566,000.00, now held by the Trustee.

To obtain the locomotives and cars necessary for immediate requirements, The Cleveland, Cincinnati, Chicago & St. Louis Railway Company, together with The New York Central & Hudson River Railroad Company, The Lake Shore & Michigan Southern Railway Company, The Michigan Central Railroad Company and The Chicago, Indiana & Southern Railroad Company has become a party to an equipment trust agreement and lease dated January 1, 1910, known as the "New York Central Lines Equipment Trust of 1910." This agreement provides for an issue of \$30,000,000 of equipment trust certificates, bearing interest at 4½% per annum, being 90% of the total cost of the equipment to be furnished under the terms of said agreement. These certificates are to be paid off in fifteen annual installments of \$2,000,000 each, the first installment being payable January 1, 1911. The cost of the equipment to be leased under the terms of the agreement by this company will be \$3,327,097.00, and its pro rata liability for certificates requiring 90% of the cost is \$2,994,387.30. Full particulars as to the character of the equipment acquired will be found upon another page.

During the year there was expended and charged to capital account, for new equipment \$5,253,563.44, including \$3,168,832.18 account of the New York Central Lines Trust of 1907 and \$2,589,139.00 account of Equipment Trust of 1910, less credit balance in equipment replacement fund at close of year, \$504,407.74. This credit balance represents original cost of various classes of equipment retired during the year, amounting to \$530,459.25 less \$26,051.51 charged to the fund on account of additions to equipment during the year.

The annual installments on Equipment Trust certificates and cash payments on Trust Equipment, amounting to \$705,229.53, have been charged to Profit and Loss and credited to Appropriated Surplus as additions to property through income.

All the principal sources of revenue have shown increases.

The increase in freight revenue of \$1,947,547.94 (10.83%) is due to increased volume of business, as there was an increase of 2,266,303 tons carried (10.97%) over last year, and an increase in revenue tons carried one mile of 344,760,832 (10.43%), while the average receipts per ton per mile and average haul of revenue freight showed only insignificant variations.

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME.

	1910. 1,982.21 miles operated.	1909. 1,982.21 miles operated.	Increase or decrease.
OPERATING INCOME.			
RAIL OPERATIONS.			
Revenues	\$30,423,004.78	\$27,657,740.99	\$2,765,263.79
Expenses	23,495,620.12	19,711,494.56	3,784,125.56
NET REVENUE FROM RAIL OPERATIONS	\$6,927,384.66	\$7,946,246.43	—\$1,018,861.77
Percentage of expenses to revenue	(77.23%)	(71.27%)	(5.96%)
OUTSIDE OPERATIONS.			
Revenues	\$335,702.20	\$305,324.92	\$30,377.28
Expenses	433,883.69	361,863.38	72,020.31
NET DEFICIT FROM OUTSIDE OPERATIONS	\$98,181.49	\$56,538.46	\$41,643.03
NET REVENUE FROM ALL OPERATIONS	\$6,829,203.17	\$7,889,707.97	—\$1,060,504.80
TAXES ACCRUED	949,548.00	878,328.26	\$71,219.74
OPERATING INCOME.	\$5,879,655.17	\$7,011,379.71	—\$1,131,724.54
OTHER INCOME.			
Joint facilities rents	\$329,149.90	\$309,155.40	\$19,994.50
Miscellaneous rents	203,603.48	132,489.89	71,113.59
Dividends on stocks owned or controlled	141,503.90	98,274.90	43,229.00
Interest on funded debt owned	45,160.00	44,260.00	900.00
Interest on other securities, loans and accounts.	91,689.56	36,177.43	55,512.13
Miscellaneous income	9,706.68	2,875.25	6,831.43
TOTAL OTHER INCOME.	\$820,813.52	\$623,232.87	\$197,580.65
GROSS CORPORATE INCOME.	\$6,700,468.69	\$7,634,612.58	—\$934,143.89
DEDUCTIONS FROM GROSS CORPORATE INCOME.			
Rentals of leased lines.	\$120,000.00	\$120,000.00	
Hire of equipment, car mileage and per diem balances.	680,209.94	482,156.54	\$198,053.40
Interest on equipment trust certificates	215,931.68	170,627.10	45,304.58
Joint facilities rents	533,661.18	499,006.81	34,654.37
Miscellaneous rents	142,868.82	142,109.70	759.12
Interest on funded debt.	3,187,574.66	2,925,848.00	261,726.66
Other interest	238,818.92	465,851.70	—227,032.78
Proportion loss operation Central Indiana Ry.	62,465.00	52,640.92	9,824.08
Discount on debenture bonds.	43,441.29		43,441.29
TOTAL DEDUCTIONS FROM GROSS CORPORATE INCOME	\$5,224,971.49	\$4,858,240.77	\$366,730.72
NET CORPORATE INCOME.	\$1,475,497.20	\$2,776,371.81	—\$1,300,874.61
Dividends preferred, four, aggregating 5%.	\$500,000.00	\$500,000.00	
Dividends common, one, 2%.	941,126.00	941,126.00	
	\$1,441,126.00	\$1,441,126.00	
SURPLUS FOR THE YEAR.	\$34,371.20	\$1,335,245.81	—\$1,300,874.61

NOTE: Minus sign (—) designates decrease.

Amount to credit of profit and loss December 31, 1909.	\$3,021,953.22
Surplus for the year 1910.	34,371.20
Add:	
Adjustment of sundry accounts.	52,082.44
	\$3,108,406.86
Deduct:	
Cash payments 1910 trust equipment.	\$258,913.90
1907 trust equipment installment.	246,689.81
1910 trust equipment installment.	199,625.82
Discount on C. C. C. & St. L. Ry Co. general mortgage bonds	74,815.00
Expenses C. C. C. & St. L. Ry Co. debenture bonds	70,488.93
Discount, commission and expenses N. Y. C. lines equipment trust 1910.	65,137.72
	915,671.18
BALANCE DECEMBER 31, 1910.	\$2,192,735.68

The increase in passenger revenue of \$642,342 (8.96%) is similarly due to increased business handled: \$381,179.97 of the increase being in interline business and \$261,162.09 in local business. There was an increase of 545,651 passengers carried (7.65%) and 33,758,388 passengers carried one mile (8.41%), with practically the same average receipts per passenger per mile as last year.

Express revenues showed an increase of \$127,480.74 (16.25%) reflecting increased volume of business handled for express company.

The decrease in revenue from operations other than transportation of \$27,688.57 is altogether attributable to change in distribution; the great majority of items appearing last year under "Rents of buildings and other property" being transferred this year to "Miscellaneous rents," under "Other income," the latter item this year showing an increase of \$71,113.50.

Revenue from car service (demurrage) shows an increase of \$37,125.47. Details of operating expenses on another page show the various fluctuations in items of expenses. The increases and decreases by departments are as follows:

Maintenance of way and structures increased.	\$774,671.47
Maintenance of equipment repairs increased.	\$700,702.02
Maintenance of equipment renewals decreased.	175,547.06
Traffic expenses increased.	84,192.37
Transportation expenses increased.	2,289,830.87
General expenses increased.	110,275.89

Of the increase in maintenance of way expenditures it will be noted that \$400,308.70 was in the three items of rails, ties and other track material

on account of the increased expenditures necessary to keep the track up to standard. There were 21,000 tons of new rail laid in 1910 as against less than 5,000 tons in 1909. The new standard of track material used is more expensive than old designs and a greater average of renewals was necessary on account of conditions existing at beginning of year.

The increase in ballast is due to extensive distribution of gravel necessary on Cleveland and Michigan Divisions.

Increases shown in grade crossings, signals and interlocking plants are of a general character due to necessary installation of crossing bells and crossing repairs and rebuilding and remodeling signals and interlocking plants on various divisions.

Of the increase shown for buildings, fixtures and grounds, amounting to \$122,828.14, important items were: \$65,400.00 for operating expense proportion of cost of new passenger station at Springfield, Ohio; \$10,000.00 for similar proportion of new freight house at Columbus, Ohio; with extensive repairs to roundhouses at Indianapolis and Cincinnati, freight houses at East St. Louis, Cincinnati and Indianapolis and to shop buildings at Brightwood, aggregating about \$25,000.00. A very important factor in this, as in other departments, was the increase necessary in all expenses of which labor was a component part; the increase in the maintenance of way department due to increased rate of wages paid employees amounting to \$156,399.65, for the year.

Increase in maintenance of equipment was principally in locomotives and freight cars and due to increased train, locomotive and car mileage made necessary by increased traffic, also to increased rate of wages paid employees of various classes which, in this department, amounted to \$169,131.86.

Increase in traffic expenses is explained by larger payments on account of expenses of fast freight lines and other agencies for soliciting and procuring traffic and the largely increased expenditures for tariffs, under present laws, reflected in the increase in stationery and printing expense of \$38,564.80.

A very important factor in the increase in transportation expenses, is, as in other departments, the increased rates of wages paid various classes of labor. The increased expense in the transportation department from this source amounted for the year to \$564,877.21. Fuel for locomotives increased \$645,255.19, of which approximately \$207,000.00 was due to increase in price of 11 cents per ton over 1909 and \$438,000.00 due to increased consumption and increased cost of handling coal stored to operate the road during coal miners' strike effective April 1. The increase shown in personal injuries, \$147,679.20, is due mainly to an unusual number of casualties in 1910. Except as above noted, the increased transportation expenses are due to increased business.

In general expenses the only item of increase calling for special mention is that of pensions, which shows an increase of \$27,282.65 under the new plan for pensioning employees, effective January 1st, 1910.

Renewals of equipment decreased \$175,547.06 due principally to the fact that in 1910 only 8 locomotives were retired from service, while 30 were retired in 1909, and 3 passenger cars in 1910, against 8 in 1909. The number of freight cars retired in 1910 was 666, as compared with 544 in 1909.

The effect of the increased ratio of operating expenses to revenue (5.96%) is shown in the fact that with an increase in operating revenues of \$2,765,263.79, there is a decrease in net operating revenue of \$1,018,861.77. The increase in net deficit from outside operations, amounting to \$41,643.03, is accounted for by the heavier loss from the operation of dining cars.

An important item in the increase in taxes, amount \$71,219.74, was the Federal Income Tax, \$31,613.12.

Other income increased \$197,580.65, due to increase in rents, dividends, interest and miscellaneous minor items.

The increase in deductions from income of \$366,730.72 is principally due to increased interest on funded debt, account of issue of debenture bonds and general mortgage bonds and larger payments for hire of equipment, the result of per diem charges increased, from 25 cents to 30 cents per day for five months of the year and to 35 cents per day for seven months of the year.

Out of the net income for the year of \$1,475,497.20 there were paid dividends of 5% on the preferred stock and 2% on the common stock, leaving a surplus for the year of \$34,371.20.

On the pages following will be found the general balance sheets and tabulated statements showing results of operation for the year.

Separate reports have been issued showing the financial condition and results from operation of the Peoria & Eastern Railway and the Cincinnati Northern Railroad for the year.

The operation of the Kankakee and Seneca Railroad (for which separate accounts are kept) shows earnings for the year \$85,723.60, operating expenses and taxes \$91,663.82, additions and betterments, \$3,273.05, deficit, \$9,213.27.

The Mt. Gilead Short Line (for which separate accounts are kept) shows earnings for the year \$5,923.06, operating expenses and taxes \$7,649.70, deficit \$1,726.64.

The Board records the death, on January 11, 1910, of Mr. H. McK. Twombly, a director of this company since June 7, 1889.

To fill the vacancy caused by the death of Mr. Twombly, Mr. Lewis Cass Ledyard was elected a director.

The Board also records the death, on December 11, 1910, of Mr. Edward V. W. Rossiter, who had been vice-president of this company since January 31, 1905.

The following appointments were made during the year:

On January 1, 1910, Richard M. Huddleston was appointed General Auditor.

On January 1, 1910, Oatley B. Cockrum was appointed Assistant General Land and Tax Agent.

On January 1, 1910, Edwin E. Pettibone was appointed Assistant General Land and Tax Agent.

On January 1, 1910, Barrett B. Mitchell was appointed Assistant to Vice-President.

On January 1, 1910, William A. Terry was appointed Assistant Freight Traffic Manager.

On January 1, 1910, James Webster was appointed Assistant Freight Traffic Manager.

On January 15, 1910, Wallace W. Rider was appointed General Superintendent of Telegraph.

On February 1, 1910, William A. Wildhack was appointed Auditor.

On February 1, 1910, John W. Daly was appointed Assistant Passenger Traffic Manager.

On April 18, 1910, Herbert J. Merrick was appointed General Superintendent of Freight Transportation.

On July 15, 1910, William K. Vanderbilt, Jr., was appointed Assistant to President.

On October 1, 1910, Edgar Freeman was appointed Assistant Treasurer.

On October 31, 1910, Joseph F. Farrell was appointed General Tie Agent.

Early in the year, railroad companies generally were compelled to make heavy advances in the rates of wages of their employees. This increase amounted for your Company to something in excess of twelve hundred thousand dollars per annum, and changed conditions of service included in the findings of the arbitrators very materially increased this amount.

The United States has the lowest freight rates of any country in the

world, and it was thought that a moderate increase in those rates was justified in order to offset the larger labor cost and to make possible a reasonable return to shareholders. This Company, and many other lines east and west, filed with the Interstate Commerce Commission, in May last, tariffs, under which freight rates on certain classes and commodities were advanced and which would have increased its earnings in about the same amount as the increase in wages. The Interstate Commerce Commission, of its own motion, instituted an investigation as to these proposed advances, and, after extended hearings, declined to allow them to go into effect.

Among other things, the Commission said that the new wage scale had not been in force long enough to show what the actual result of operating under it would prove to be.

So far as this Company is concerned, it can hardly be said that there was any necessity to wait for experience to show what effect these added burdens would have upon its net revenue. The Commission took as typical roads, the Pennsylvania, the Baltimore & Ohio, and the New York Central (with the Lake Shore and the Michigan Central); and it was after analyzing their condition and necessities that it reached the conclusion that the proposed increase in freight rates was not justified. It is not to be expected that the power to regulate rates will be so exercised as to permanently prevent companies such as this, which serve large cities and a populous territory, from charging rates sufficiently high to insure a fair return on the money invested. Such a policy must, if continued, result in the gradual lowering of efficiency and character of service of the roads to which it is applied, with some measure of injury to the communities they serve. It is unfortunate, therefore, that the Commission found no practical way to give relief to this and other Companies similarly affected, where the need of larger net revenues was so clearly shown.

The Company for the present must carry the additional load of these increased wages without any corresponding advance in freight rates.

The present high level of wages in railway service is the result of successive mediations and arbitrations under the Federal Statute known as the Erdman Act; the practical effect of which has been to deprive the roads in very large measure of control over this most important item in cost of operation, representing as it does between sixty-three and sixty-five per cent. of the total.

Without entering upon a discussion as to the fairness of the present wage basis, it may be stated that, in the opinion of railroad managers of long experience, it is higher than can be maintained by many of the roads on the present basis of passenger and freight rates in the territory between Chicago and St. Louis, and the Atlantic Seaboard.

Appreciative acknowledgment is made of the faithful, efficient performance of duty by employees in every department of the service during the year.

WILLIAM C. BROWN,
President.

CONDENSED GENERAL BALANCE SHEET, DECEMBER 31, 1910.

Assets.	
Property owned as investment.	
Physical property owned.....	\$135,894,782.72

Assets.		
Securities owned		\$1,978,577.00
Other investments		1,126,555.22
Total		\$138,999,914.94
Working assets.		
Cash		2,866,045.28
Securities issued or assumed held in treasury.....		86,555.00
Marketable securities		110,001.00
Loans and bills receivable.....		320,631.59
Traffic and car service balances due from other companies.....		963,688.15
Net balance due from agents and conductors.....		865,546.81
Miscellaneous accounts receivable.....		2,240,206.65
Materials and supplies.....		1,593,432.22
Total working assets		\$9,046,106.70
Deferred debit items		5,733,613.54
Total assets		\$153,779,635.18
Liabilities.		
Stock.		
Capital stock:		
Common stock	\$47,056,300.00	
Preferred stock	10,000,000.00	
Cincinnati, Sandusky & Cleveland Railway preferred stock	428,997.45	
Stock liability for conversion of outstanding securities of constituent companies.....	10,791.01	\$57,496,088.46
Mortgage, bonded and secured debt.		
Funded debt:		
Mortgage bonds	\$56,183,730.00	
Collateral trust bonds	10,000,000.00	
Plain bonds, debentures and notes.....	14,653,605.94	
Equipment trust certificates 1907.....	2,960,277.73	
Equipment trust certificates 1910.....	2,994,387.30	86,792,000.97
Working liabilities.		
Audited vouchers and wages unpaid.....	\$4,947,662.72	
Miscellaneous accounts payable.....	10,909.80	
Matured dividends, interest and rents unpaid	678,905.22	
Working advances due to other companies..	112,086.78	
Other working liabilities	6,561.78	5,756,126.30
Accrued liabilities not due.....		823,472.30
Deferred credit items		13,981.94
Appropriated surplus		705,229.53
Profit and loss—Surplus		2,192,735.68
Total liabilities		\$153,779,635.18

SIXTY-FIFTH ANNUAL REPORT, MICHIGAN CENTRAL RAILROAD COMPANY: FOR THE YEAR ENDED DECEMBER 31, 1910.

To the Stockholders of

THE MICHIGAN CENTRAL RAILROAD COMPANY.

The Board of Directors herewith submits its report for the year ended December 31, 1910, with statements showing the results for the year and the financial condition of the company.

The report covers the operation of the following mileage:

	Miles.
Main line	270.07
Proprietary lines	345.05
Leased lines	1,091.66
Lines operated under trackage rights.....	92.01

Total road operated (as shown in detail on another page) 1,803.29

The total road operated as shown in the report for 1909 was 1,746.46 miles. The increase of 56.83 miles shown for this year is accounted for as follows:

Added:		
Detroit River Tunnel, opened during the year.....	2.42	
Operated under trackage rights, not heretofore shown in table of tracks	78.01	80.43
Deducted:		
Jackson, Lansing & Saginaw railway track (Saginaw Bay & Northwestern branch) taken up.....	23.60	
Net increase	56.83	

There was no change in capital stock during the year, the amount authorized and outstanding being

The funded debt outstanding December 31, 1909, was

It has been increased during the year ended December 31, 1910, by the issue of this company's fifty-year four per cent. bonds out of an authorized total of \$4,500,000.00 (secured by mortgage executed by this company and the Grand River Valley Railroad Company, dated September 1, 1909), for the purpose of refunding a like amount of Michigan Central-Grand River Valley six per cent. bonds, maturing September 1, 1909.....

There has also been placed upon the general books of the company its pro rata liability in connection with the certificates issued under the New York Central lines equipment trust agreements of 1907 and 1910..

It has been decreased during the year ended December 31, 1910, as follows:

Michigan Central three-year five per cent. gold notes, maturing February 1, 1910, surrendered and paid

Installment on New York Central lines equipment trust certificates of 1907, paid November 1, 1910

Total funded debt December 31, 1910 (detail on another page)

The total amount charged to road and equipment on December 31, 1910, was \$64,807,028.32, as follows:

Amount charged against main line to December 31, 1909

There was charged for additions and betterments in 1910, as shown in detail on another page.

Against capital account:
For road

For equipment

Against income account:
For equipment

Total main line

Amount charged account leased lines to December 31, 1909

There was charged for additions and betterments in 1910 against capital account for road, as shown in detail elsewhere.....

Total leased lines

Total to December 31, 1910.....

The construction of the double tube tunnel under and across the Detroit River, begun in October, 1906, by the Detroit River Tunnel Company, the entire capital stock of which is owned by this company, as referred to in a previous report, has been practically completed, and has proved an entire success. It was put into experimental use for through freight traffic October 9, 1910. The Chief Engineer of the Canadian Railway Commission inspected and approved the work and the Commission issued its order authorizing the use of the tunnel October 14, 1910. Regular freight and passenger service was inaugurated October 16, 1910. There still remains some work to be done, consisting principally of the interlocking system and additional equipment for the electrical sub-station, which it is estimated will cost \$200,533.00, making the total cost, including interest on the money advanced from time to time by the Michigan Central, \$8,922,165.00. The acquisition of terminal freight and passenger yards and station buildings by the Tunnel Company will require a considerable sum in addition to the amount above mentioned.

The important litigation pending for a number of years between this Company and the State of Michigan relative to this Company's claim against the State growing out of the repeal of its special charter, and the counter claim of the State against this Company for alleged non-payment of back taxes during the years 1855 to 1893, was adjusted in June, 1910, by the payment to the State of \$125,000.00.

To obtain the locomotives and cars necessary for immediate requirements, The Michigan Central Railroad Company, together with The New York Central & Hudson River Railroad Company, The Lake Shore & Michigan Southern Railway Company, The Cleveland, Cincinnati, Chicago & St. Louis Railway Company and the Chicago, Indiana & Southern Railroad Company has become a party to an equipment trust agreement and lease dated January 1, 1910, known as the "New York Central Lines Equipment Trust of 1910." This agreement provides for an issue of \$30,000,000 of equipment trust certificates, bearing interest at 4½% per

annum, being 90% of the total cost of the equipment to be furnished under the terms of said agreement. These certificates are to be paid off in fifteen annual installments of \$2,000,000.00 each, the first installment being payable January 1, 1911. The cost of the equipment to be leased under the terms of the agreement by this company will be \$5,651,637.00 and its pro rata liability for certificates representing 90% of the cost is \$5,086,473.30. Full particulars as to the character of the equipment acquired will be found upon another page.

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME.

	1910. 1,803.29 miles operated.	1909. 1,746.46 miles operated.	Increase or decrease. 56.83 miles operated.
OPERATING INCOME.			
RAIL OPERATIONS.			
Revenues	\$29,694,815.71	\$27,415,467.20	\$2,279,348.51
Expenses	21,628,906.26	18,499,528.24	3,129,378.02
NET REVENUE FROM RAIL OPERATIONS	\$8,065,909.45	\$8,915,938.96	—\$850,029.51
Percentage of expenses to revenue	(72.84%)	(67.48%)	(5.36%)
OUTSIDE OPERATIONS:			
Revenues	\$543,636.69	\$489,927.04	\$53,709.65
Expenses	599,951.82	541,079.10	58,872.72
NET DEFICIT FROM OUTSIDE OPERATIONS	\$56,315.13	\$51,152.06	\$5,163.07
NET REVENUE FROM ALL OPERATIONS	\$8,009,594.32	\$8,864,786.90	—\$855,192.58
TAXES ACCRUED	1,357,019.92	1,121,531.99	235,487.93
OPERATING INCOME	\$6,652,574.40	\$7,743,254.91	—\$1,090,680.51
OTHER INCOME.			
Joint facilities rents	\$229,289.51	\$185,157.79	\$44,131.72
Miscellaneous rents	2,676.02	3,011.19	—\$335.17
Dividends on stocks owned or controlled	287,241.50	248,153.85	39,087.65
Interest on funded debt owned	46,880.00	33,760.00	13,120.00
Interest on other securities, loans and accounts	440,969.02	471,397.82	—30,428.80
Miscellaneous income	86,623.87		86,623.87
TOTAL OTHER INCOME	\$1,093,679.92	\$941,480.65	\$152,199.27
GROSS CORPORATE INCOME	\$7,746,254.32	\$8,684,735.56	—\$938,481.24
DEDUCTIONS FROM GROSS CORPORATE INCOME.			
Rentals of leased lines	\$585,310.00	\$510,310.00	\$75,000.00
Hire of equipment			
Car mileage and per diem balances	1,073,983.18	714,640.99	359,342.19
Interest on equipment trust certificates	261,523.99	180,127.61	81,396.38
Joint facilities rents	620,568.83	516,400.76	104,168.07
Miscellaneous rents	6,069.24	5,959.84	109.40
Interest on funded debt	2,535,398.33	2,451,584.32	83,814.01
Other interest	746,367.95	747,290.52	—922.57
Other deductions	199,701.96	137,000.00	62,701.96
TOTAL DEDUCTIONS FROM GROSS CORPORATE INCOME	\$6,028,923.48	\$5,263,314.04	\$765,609.44
NET CORPORATE INCOME	\$1,717,330.84	\$3,421,421.52	—\$1,704,090.68
DIVIDENDS, TWO, AGGREGATING 6%	1,124,287.00	1,124,280.00	
SURPLUS	\$593,050.84	\$2,297,141.52	—\$1,704,090.68
Additional equipment		\$548,924.72	—\$548,924.72
On account 1910 proportion of New York Central Lines, 1907 and 1910 equipment trusts	\$250,000.00		250,000.00
BALANCE TO PROFIT AND LOSS.	\$343,050.84	\$1,748,216.80	—\$1,405,165.96

NOTE.—Minus sign (—) designates decrease.

BALANCE TO PROFIT AND LOSS FOR YEAR 1910	\$343,050.84
AMOUNT TO CREDIT OF PROFIT AND LOSS DECEMBER 31, 1909	9,965,978.28
	\$10,309,029.12
DEDUCT:	
Balance of 1910 proportion of New York Central Lines 1907 and 1910 equipment trust installments	\$349,523.67
Ten per cent. payments account of equipment trust of 1910	481,807.00
Discount, commission and expenses in connection with New York Central Lines equipment trust certificates of 1910, Michigan Central-Grand River Valley Bonds and Michigan Central one year francs notes	240,356.38
Payment to State of Michigan in consideration of discontinuance of pending litigation	125,000.00
Deficit from operation Detroit Terminal Railroad prior to 1910, property abandoned and sundry uncollectible accounts	60,389.96
	1,257,077.01
BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1910	\$9,051,952.11

The total operating revenues were \$29,694,815.71, an increase of \$2,279,348.51 as compared with the previous year. The freight revenue was \$19,282,288.45, an increase of \$1,014,758.01. This was due to increased movement of coal, stone, forest products and miscellaneous commodities. The passenger revenue was \$7,404,475.66, an increase of \$748,776.81, due to a large excursion travel and general improvement in both local and interline business. The express revenue was \$1,519,949.67, an increase of \$275,204.53, due to an enlarged volume of business. The revenue from the transportation of mails was \$431,625.32, an increase of \$22,413.09, due

principally to additional compensation allowed by the United States Government, from July 1st, 1910, for carrying through mails. The operating revenue from all other sources increased to \$18,196.07 over the previous year. The total expenses of operation were \$21,628,906.26, an increase of \$3,129,378.02, due very largely to increased cost of labor, cost of fuel consumed and material used.

Maintenance of way and structures increased \$577,695.54, due to additional expenditures for repairs to roadway, track, bridges, buildings and separation of grades; increased expenditure for labor amounted to \$377,640.46, of which \$212,719.16 was due to increased rates of pay.

Maintenance of equipment increased \$367,783.79, account of extensive repairs to and renewals of locomotives and cars of all classes. The increase account of labor amounted to \$170,511.92, of which \$74,081.46 was due to increased rates of pay. Traffic expenses increased \$104,482.86, due largely to tentative changes in tariffs.

Transportation expenses increased \$1,972,899.20, due to the heavy volume of traffic handled and the large increase in cost of labor and fuel. Increase account of labor amounted to \$1,347,207.73, of which \$458,816.94 was due to increased rates of pay. Increase account of fuel consumed amounted to \$407,605.05, of which \$99,719.13 was due to increase in price. General expenses increased \$107,116.63, which includes an increase in pay roll expenditure of \$23,498.53, of which \$5,995.00 was due to increased rates of pay.

There was an increase in the deficit from outside operations of \$5,163.07 over the previous year, due to additional expenditures in the operation of dining car service and grain elevators, offset by increased revenue from stock yards service and restaurant service. The operating income was \$6,652,574.40, a decrease of \$1,090,680.53. Other income was \$1,093,679.92, an increase of \$152,199.59, due to additional amount received from rentals, also interest and dividends from securities.

Total deductions from income amounted to \$6,028,923.48, an increase of \$765,609.44, due to interest on gold debentures and equipment trust certificates, additional rental paid Canada Southern Railway Company in accordance with the terms of the lease; increased amounts paid for hire of equipment and rentals of joint facilities; and proportionate share of deficits from operation of Indiana Harbor Belt and Detroit Terminal Railroads. The profit from operation for the year, after payment of 6% in dividends upon the capital stock, and proportion of 1907 and 1910 trust equipment installments chargeable to the current year, was \$343,050.84, which has been carried to the credit of profit and loss.

Mr. Ashley Pond, Advisory Counsel of this Company, died January 12, 1910. Mr. Pond became a director of the company in 1878, and with the interval of the two years between 1883 and 1885, remained a director until 1906, when he retired from active work, but continued as Advisory Counsel until his death. He was also for a time General Counsel of the Lake Shore & Michigan Southern Railway Company. The great value of his services, the benefit of the wise and sound advice of so eminent a member of the profession, the kindly character of the man, and his loyalty to the company and its interests, cannot be too highly expressed. The Board records the death, on January 11, 1910, of Mr. Hamilton McK. Twombly, a director of this company since December 21, 1899. The Board also records the death, on December 11, 1910, of Mr. Edward V. W. Rossiter, a vice president of this company since June 23, 1904.

On March 1, 1910, Mr. Lewis Cass Ledyard was appointed a director to fill the vacancy caused by the death of Mr. Twombly.

The following appointments of officials were made during the year: January, Richard M. Huddleston, General Auditor; Barrett B. Mitchell, Assistant to Vice President C. F. Daly; Edwin E. Pettibone, Assistant General Land and Tax Agent; Otley P. Cockrum, Assistant General Land and Tax Agent; Malcolm T. Wright, Superintendent of Terminals, Detroit; William H. O'Keefe, Division Superintendent, Jackson; Wallace W. Ryder, General Superintendent of Telegraph; February, John W. Darly, Assistant Passenger Traffic Manager; March, Nathaniel E. Slaymaker, Real Estate Attorney; April, Herbert J. Merrick, General Superintendent of Freight Transportation; June, Roscoe B. Kendig, General Mechanical Engineer, succeeding Frederic M. White, resigned; July, Arthur C. Thomas, Car Accountant; William Hutchinson, Land and Tax Agent, succeeding Nathaniel E. Slaymaker, transferred; Sept., J. Walter Dohany, Attorney, succeeding George L. Nadollec, retired; October, Edgar Freeman, Assistant Treasurer; October, Joseph F. Farrell, General Tie Agent, succeeding William F. Goltra, resigned.

Appreciative acknowledgment is made of the faithful, efficient performance of duty by employees in every department of the service during the year.

WILLIAM C. BROWN,
President.

CONDENSED GENERAL BALANCE SHEET, DECEMBER 31, 1910.

Assets.	
Property investment, total cost of road and equipment	\$64,807,028.32
Securities	7,039,191.50
Other investments	3,570,755.22
Total property owned as investment	\$75,416,975.04
Working assets:	
Cash	10,173,066.46
Accrued income not due:	
Unmatured interest, dividends and rents receivable	1,024,493.81
Deferred debit items	11,545,748.65
Total	\$98,160,283.96
Liabilities.	
Capital stock—common	\$18,738,000.00
Funded debt—	
Mortgage bonds:	
Michigan Central first mortgage	\$14,000,000.00
Grand River Valley first mortgage	1,500,000.00
Detroit & Bay City first mortgage	4,000,000.00
Kalamazoo & South Haven first mortgage	700,000.00
Michigan Air Line first mortgage	2,600,000.00
Jackson, Lansing and Saginaw first mtge.	1,725,000.00
Joliet & Northern Indiana first mortgage	1,500,000.00
Plain bonds, debentures and notes:	
Gold debentures	7,634,000.00
Equipment trust certificates, 1907	3,125,105.38
Equipment trust certificates, 1910	5,086,473.30
Total capitalization	\$60,608,578.68
Working liabilities	23,402,006.57
Accrued liabilities not due	1,026,946.03
Deferred credit items	401,954.45
Appropriated surplus: Additions to property through income since June 30, 1907	3,668,846.12
Profit and loss: Surplus	9,051,952.11
Total	\$98,160,283.96